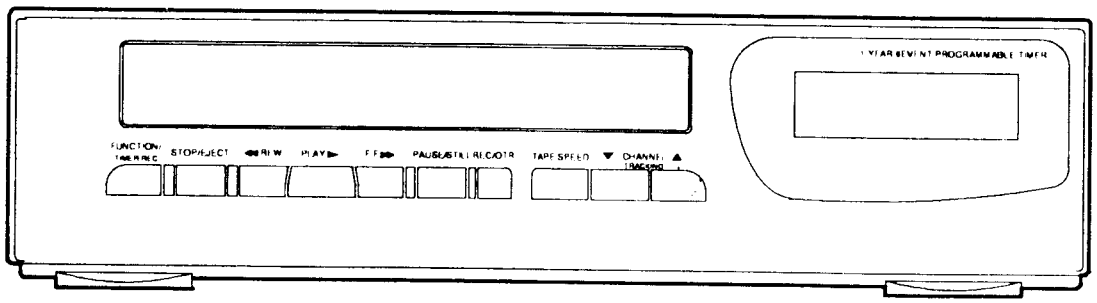
FUNAI

SERVICE MANUAL

VIDEO RECORDER

MODEL NO. 4A-005/4A-015/4A-025/4A-035



VHS HQ
PAL

Video cassette recorders bearing the "HQ" mark incorporate VHS high quality technology. Note that there is interchangeability with former VHS video cassette recorders.

FUNAI ELECTRIC CO., LTD.

MAIN SECTION

MODEL NO. 4A-005/4A-015/ 4A-025/4A-035

VIDEO RECORDER

MAIN SECTION

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SPECIFICATIONS

Test Items	Unit	Minimum	Normal	Maximum	Note
1. VIDEO					
1-1 Video Output (PB)	Vp-p	0.8	1.0	1.2	F6A
1-2 Video Output (R/P)	Vp-p	0.8	1.0	1.2	
1-3 Video S/N (R/P)	dB	40	43		
1-4 Video Color S/N AM (R/P)	dB	37	41		
1-5 Video Color S/N PM (R/P)	dB	30	36		
1-6 Resolution (R/P)	Line	230	245		
2. SERVO					
2-1 Jitter at Low (PB)	µsec		0.07	0.12	F6N
2-2 Wow & Flutter (R/P)	%		0.3	0.5	E-30
3. AUDIO					
3-1 Output (PB)	dBv	-11	-8	-5	F6A
3-2 Output (R/P)	dBv	-11	-8	-3.5	
3-3 S/N (R/P)	dB	36	41		
3-4 Distortion (R/P) input; -10dBv	%		1.0	4.0	
3-5 Freq. resp (R/P) at 200Hz	dB	-6	0	3	
input; -20dB 8KHz	dB	-12	-6	0	
4. TUNER					
4-1 Channel VHF LOW	ch		E2-E4, X, Y, Z, S1, S2		
HIGH	ch		E5-E12, S3-S20		
UHF	ch		E21-E69		
4-2 Video Output	Vp-p	0.8	1.0	1.2	
4-3 Video S/N (E45ch)	dB	39	42		
4-4 Audio Output	mV/rms	300	550	700	
4-5 Audio S/N	dB	40	46		

PAL (B/G)+CATV

Note:

1] Nominal specifications represent the design specifications. All unit should be able to approximate these-some will exceed and some may drop slightly below these specifications. Limit specifications represent the absolute worst condition that still might be considered acceptable; in no case should a unit fail to meet limit specifications.

2] Specifications are subject to modification.

2. LEAKAGE CURRENT TEST

Confirm specified (or lower) leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method : (Power ON)

Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See Figure 2 and following table.

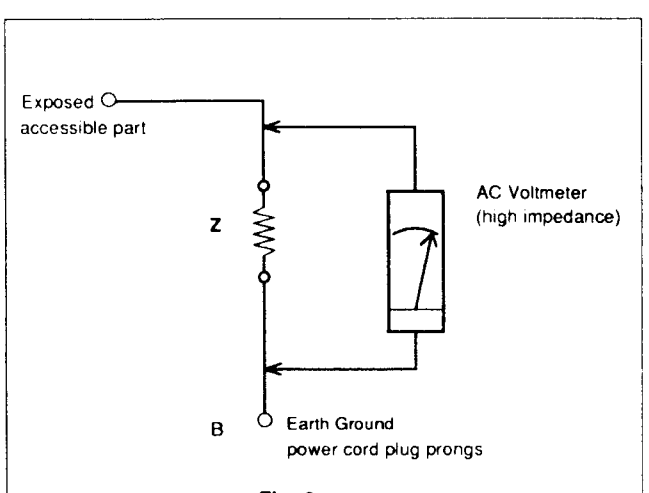


Fig. 2

Table 2 : Leakage current ratings for selected areas

AC Line Voltage	Region	Load Z	Leakage Current (i)	Earth Ground (B) to:
200 to 240 V	Europe Australia	2kΩ RES. in connected	1 ≤0.7mA Peak 1 ≤2mA dc	Antenna terminals
		50kΩ RES. in connected	1 ≤0.7mA Peak 1 ≤2mA dc	Other terminals

Note:

This table is unofficial and for reference only. Be sure to confirm the precise values.

IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, our products are strictly inspected for recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

PRECAUTIONS DURING SERVICING

1. Locations requiring special caution are denoted by labels and inscribed on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the symbol ⚠ are critical for safety. Replace only with specified part numbers.

3. Use specified internal wiring. Note especially :
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

4. Use specified insulating materials for hazardous live parts. Note especially :
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors

5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely around the terminals before soldering.

6. Observe that wires do not contact heat producing parts (heat sinks, oxide metal film resistors, fusible resistors, etc.)

7. Check that replaced wires do not contact sharp edged or pointed parts.

8. When a power cord has been replaced, check that 10-15 kg (23-34.5lbs) of force in any direction will not loosen it after assembling completely.

9. Also check areas surrounding repaired locations.

SAFETY CHECK AFTER SERVICING

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. CLEARANCE DISTANCE

When replacing primary circuit components, confirm specified clearance distance (d) and (d') between soldered terminals, and between terminals and surrounding metallic parts. See Figure 1 at right.

Table 1 : Ratings for selected area

AC Line Voltage	Region	Clearance Distance (d) (d')
200 to 240 V	Europe Australia	≥ 4mm (d) ≥ 6mm (d')

Note:
This table is unofficial and for reference only. Be sure to confirm the precise values.

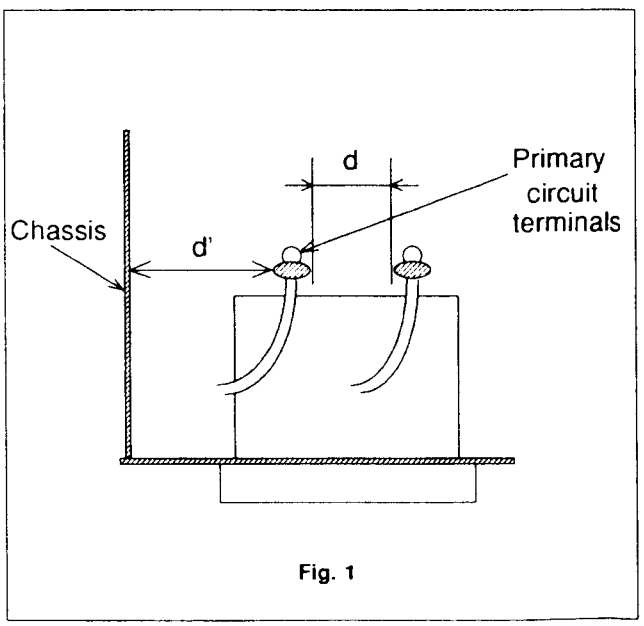
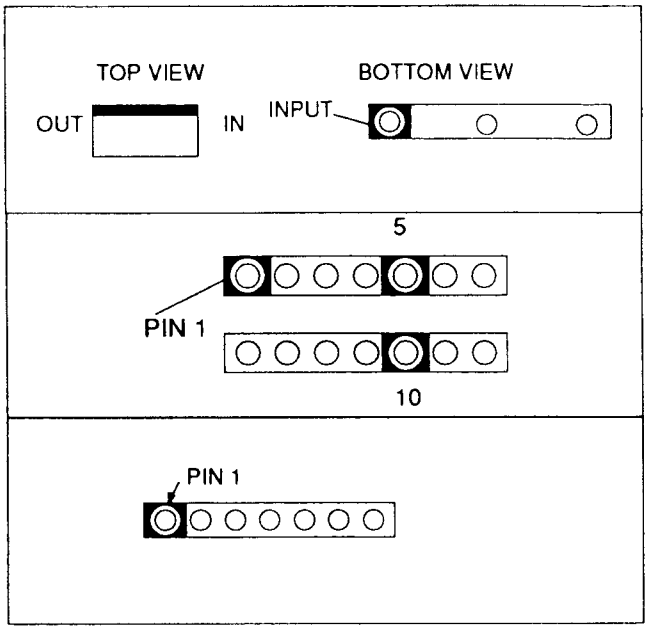


Fig. 1

STANDARD NOTES FOR SERVICING

CIRCUIT BOARD INDICATIONS

a. The output pin of the 3 pin Regulator ICs is indicated as shown.



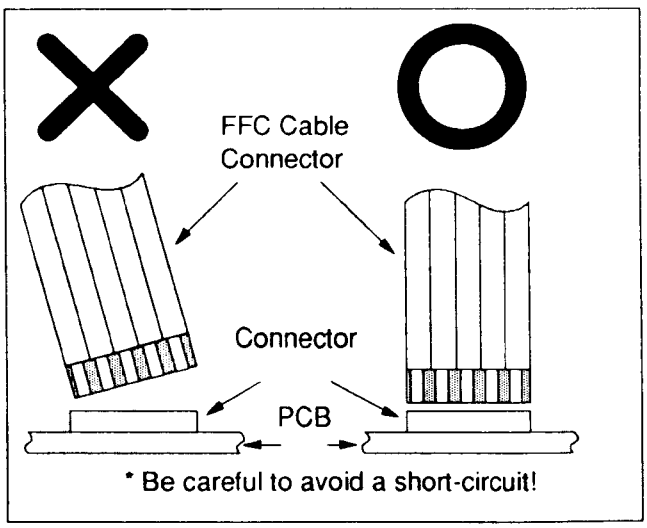
b. For other ICs, pin 1 and every fifth pin are indicated as shown.

c. The 1st pin of every pin connectors are indicated as follows :

INSTRUCTIONS FOR CONNECTORS

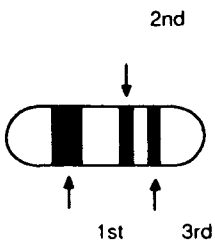
1. When you connect or disconnect FFC cable (connector), be sure to disconnect the AC cord.

2. FFC cable (connector) should be inserted parallel into the connector, not at an angle.



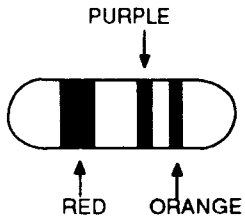
How to read the values of the cylindrical type chip components

The widest color band must be read first for value.



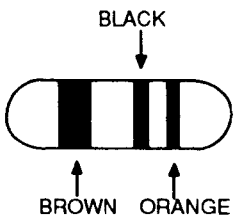
EXAMPLE :

(a) Resistor



= 273 = 27 [kΩ]

(b) Capacitor



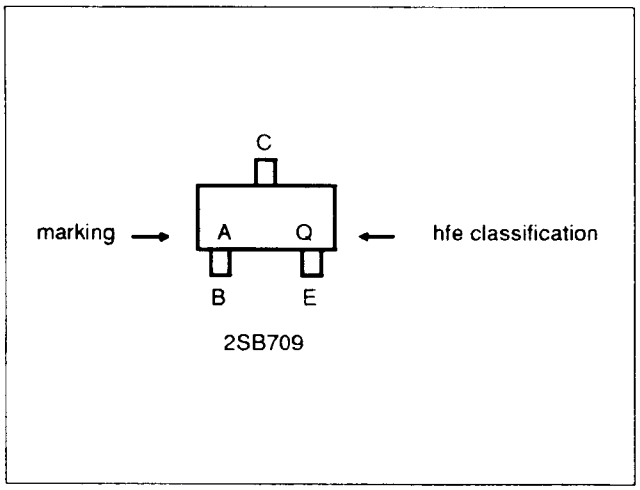
= 103 = 0.01 [uF]

CAUTION:

Once chip parts (Resistors, Capacitors, Transistors, etc.) are removed, they must not be reused. Always use a new part.

How to Read the Identification Mark of Chip Transistors in this Unit.

MARKING	PART NO.
A	2SB709
U	2SC2404
Y	2SD601
1D	2SD1328
25	DTC124EK
26	DTC144EK
2Y	2SC3757
6C	UN2113
8B	UN2212
8C	UN2213



REPLACEMENT PROCEDURES FOR LEADLESS (CHIP) COMPONENTS

The Following Procedures are Recommended for the Replacement of the Leadless Components Used in this Unit.

1. **Preparation for replacement**

a. Soldering Iron

Use a pencil-type soldering iron (less than 30 watts).

b. Solder

Eutectic solder (Tin 63%, Lead 37%) is recommended.

c. Soldering time

Do not apply heat for more than 4 seconds.

d. Preheating

Leadless capacitor must be preheated before installation.

(130C-150C, for about two minutes.)

Note:

a. Leadless components must not be reused after removal.

b. Excessive mechanical stress and rubbing for the component electrode must be avoided.

With Iron Wire:

(1)Using De-soldering braid, remove the solder from all pins of the Flat Pack - IC. When you use solder flux which is applied to all pins of the Flat Pack - IC, you can remove it easily.

(2)Affix the wire to a workbench or solid mounting point, as shown in Fig. S-1-5.

(3)Pull up the wire as the solder melts so as to lift the IC leads from the P.C.B. contact pads, while heating the pins using a fine tip soldering iron or hot air blower.

Note:

When using a soldering iron, care must be taken to ensure that the Flat Pack - IC is not being held by glue, or when it is removed from the P.C.B., it may be damaged if force is used.

2. Installation

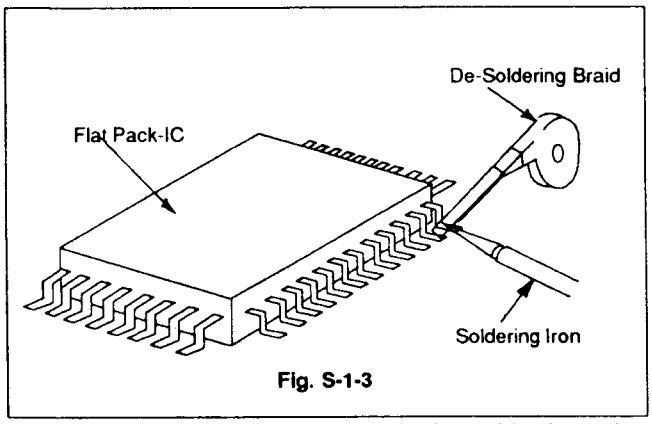


Fig. S-1-3

(1)Using a De-solder braid, remove the solder from the foil of each pin of the Flat Pack - IC on the P.C.B., so you can install a replacement Flat Pack - IC more easily.

(2)The "●" mark on the Flat Pack - IC indicates pin 1 (See Fig. S-1-6). Make sure this mark matches the 1 on the P.C.B when positioning for installation. Then pre - solder the four corners of the Flat Pack- IC (See Fig.S-1-7).

(3)Solder all pins of the Flat Pack - IC. Make sure that none of the pins have solder bridges.

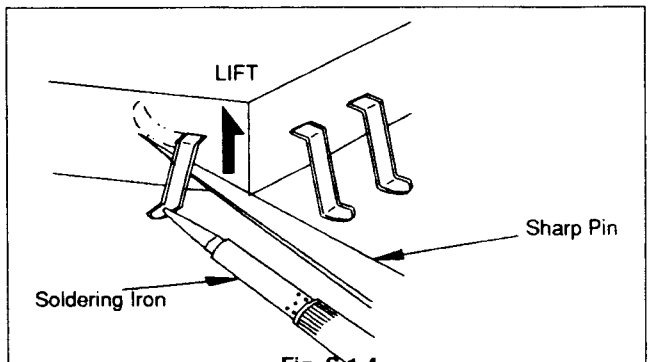


Fig. S-1-4

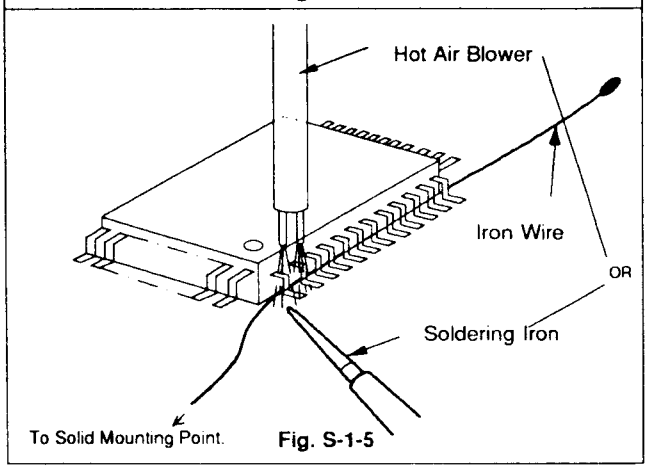


Fig. S-1-5

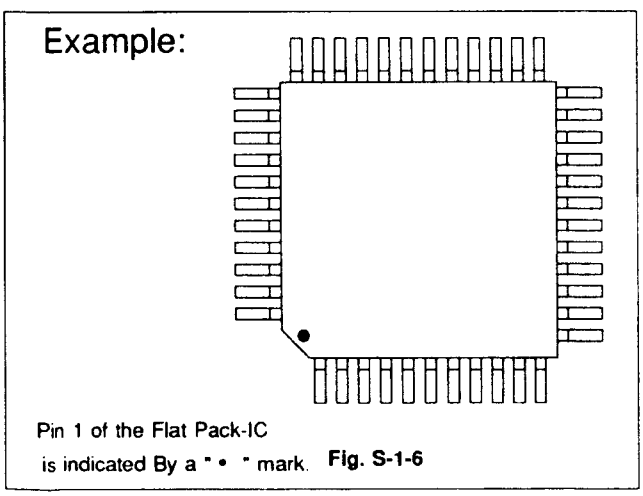


Fig. S-1-6

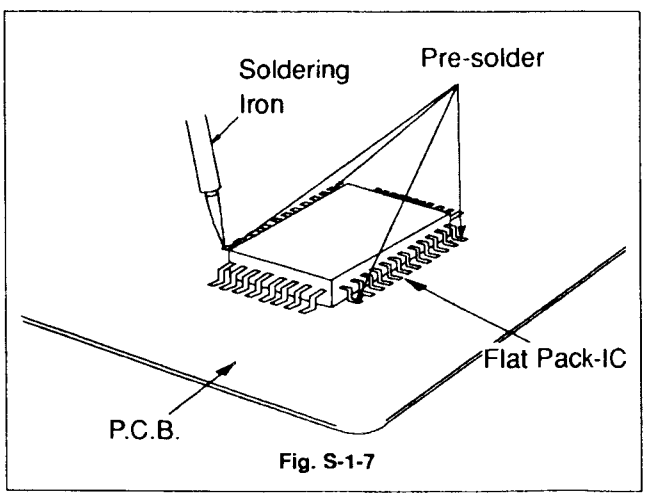


Fig. S-1-7

2. Removing the leadless component

Grasp the leadless component body with tweezers and alternately apply heat to both electrodes. When the solder on both electrodes has melted, remove leadless component with a twisting motion.

Note:

a. Do not attempt to lift the component off the board until the component is completely disconnected from the board by the twisting action.

b. Take care not to break the copper foil on printed board.

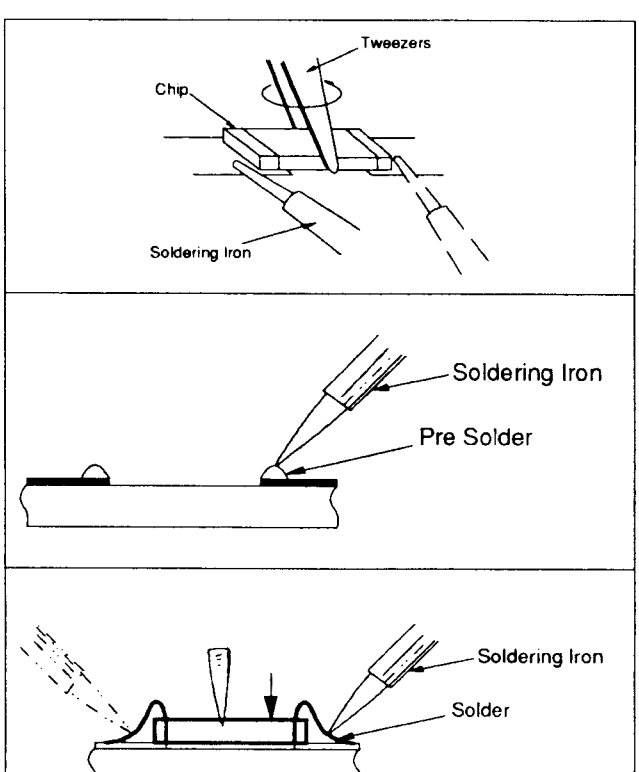
3. Installing the leadless component

a. Presolder the contact points of the circuit board.

b. Press the part downward with tweezers and solder both electrodes as shown below.

Note:

Do not glue the replacement leadless component to the circuit board.



HOW TO REMOVE / INSTALL FLAT PACK IC

1. Removal

With Hot - Air Flat Pack - IC Desoldering Machine:

(1)Prepare the HOT - AIR FLAT PACK - IC DESOLDERING MACHINE, then apply hot air to Flat Pack - IC (about 5~6 seconds).

(2)Remove the Flat Pack- IC with tweezers while applying the hot air.

Caution:

1. Do not supply the hot air to the chip parts around the Flat Pack - IC for over 6 seconds as damage may occur to the chip parts. Put Masking Tape around the Flat Pack - IC to protect other parts from damage.
2. The Flat Pack - IC on the P.C.B. is affixed with glue, so be careful not to break or damage the foil of each pin or solder lands under the IC when removing it.

With Soldering Iron:

(1)Using De - solder braid, remove the solder from all pins of the Flat Pack - IC. When you use solder flux which is applied to all pins of the Flat Pack - IC, you can remove it easily.

(2)Lift each lead of the Flat Pack - IC upward one by one, using a sharp pin or wire to which solder will not adhere (iron wire). When heating the pins, use a fine tip soldering iron or a hot air blower.

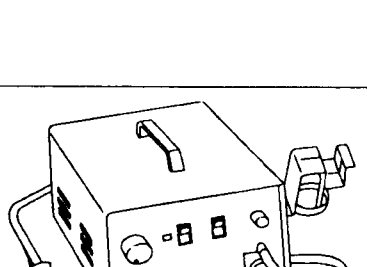


Fig. S-1-1

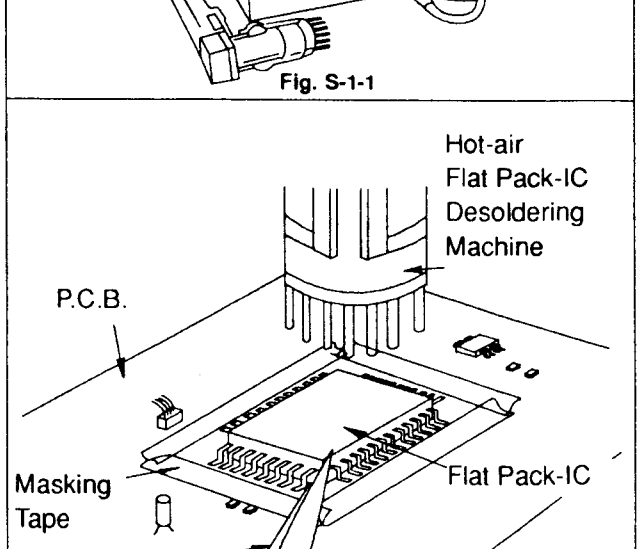


Fig. S-1-2

PREPARATION FOR SERVICING

Note:

Optical System is used for Tape Start and End detection. So there are cases unit moves incorrectly when Top Cover is removed.

Preparing:

Insert the service connector (B) (Fig. B) to the connector base of unit (A) (Fig. A) to cut the signal from sensors.

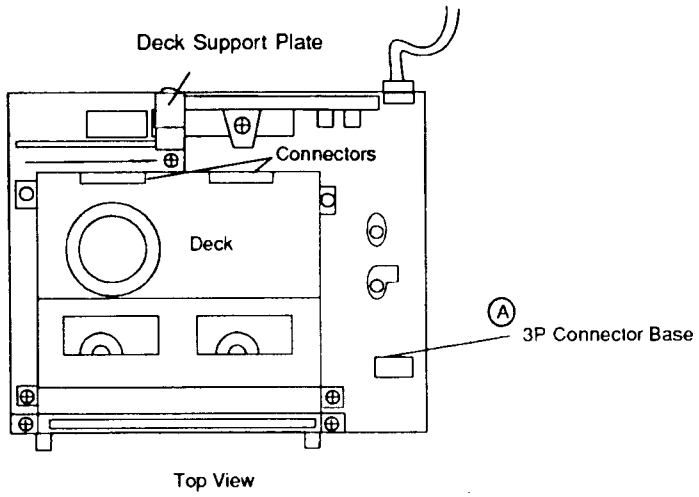


Fig. A

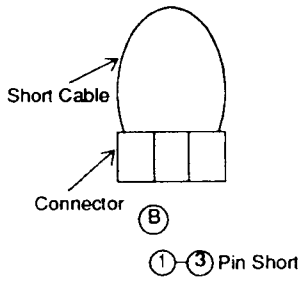


Fig. B

[CIRCUIT]

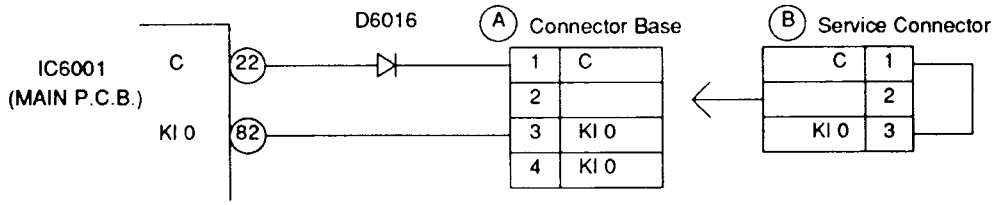


Fig. 1

INSTRUCTIONS FOR HANDLING SEMICONDUCTORS

Electrostatic breakdown of the semiconductors may occur due to a potential difference caused by electro-static charge during unpacking or repair work.

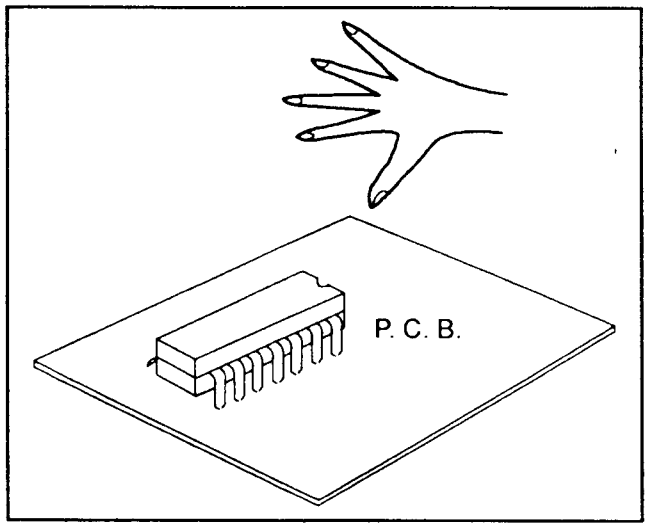
Ground for Human Body

Be sure to wear a grounding band (1M ohm) that is properly grounded to remove any static electricity that may be charged on the body.

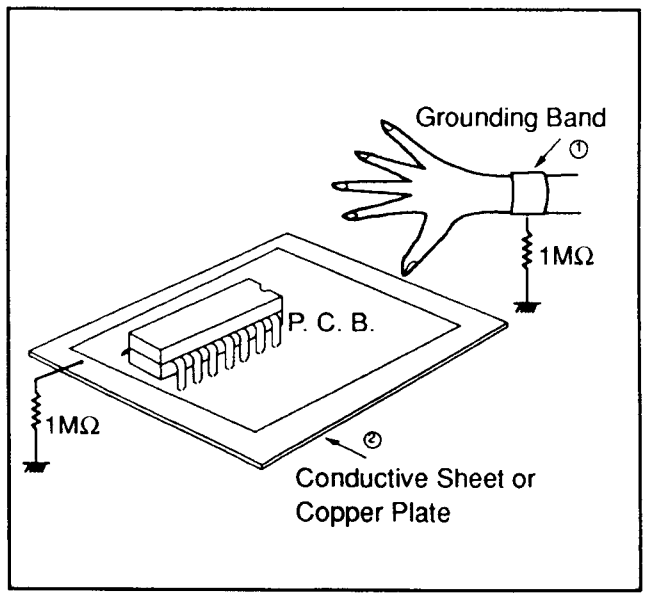
Ground for Work Bench

Be sure to place a conductive sheet or copper plate with proper grounding (1M ohm) on the work bench or other surface, where the semiconductors are to be placed. Because the static electricity charge on the clothing will not escape through the body grounding band, be careful to avoid contacting semiconductors to clothing.

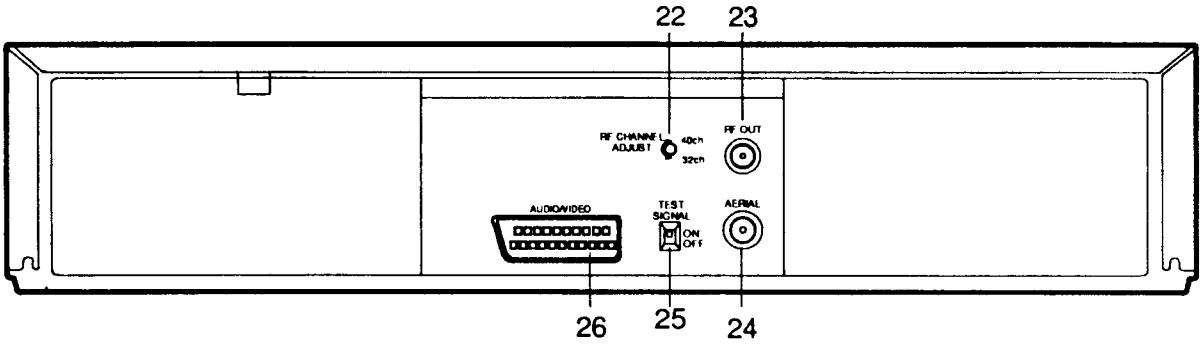
INCORRECT



CORRECT



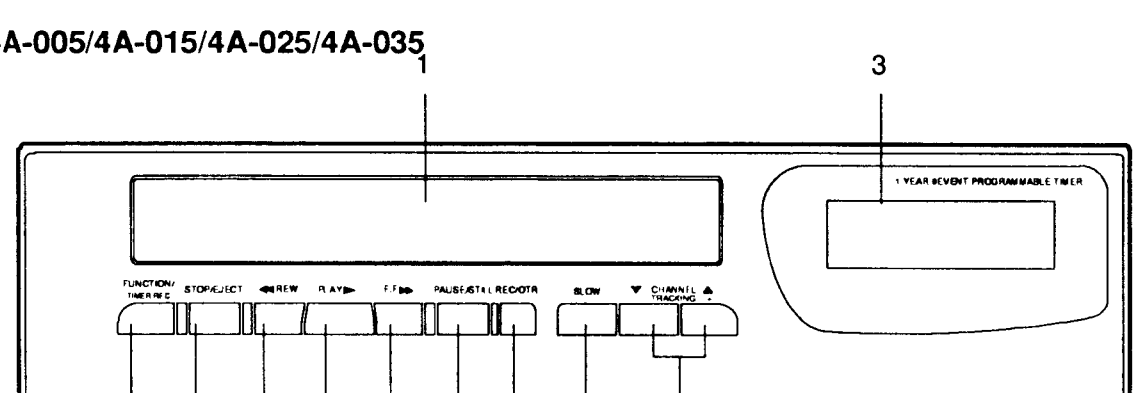
—REAR VIEW AND TERMINALS—



OPERATING CONTROLS AND FUNCTIONS

—FRONT VIEW—

4A-005/4A-015/4A-025/4A-035



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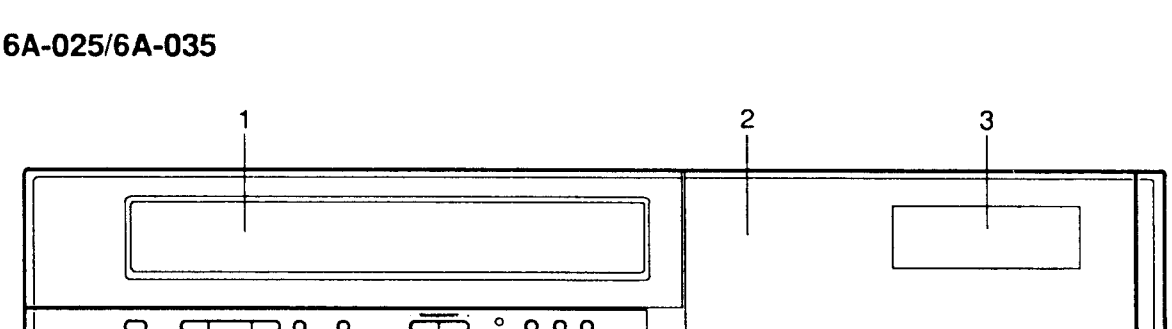

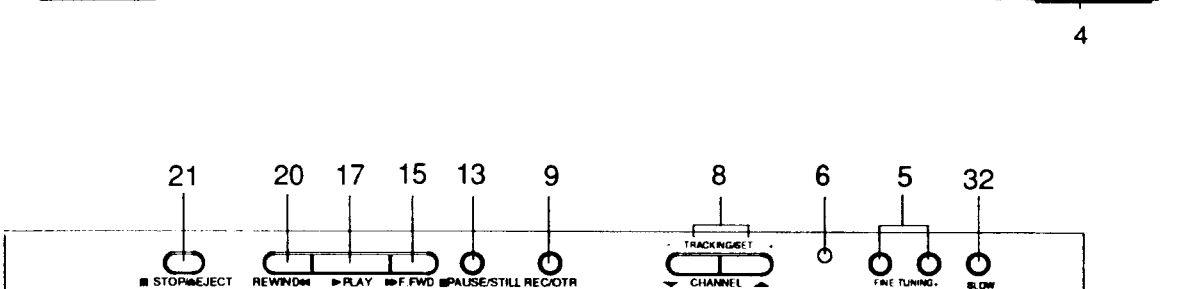

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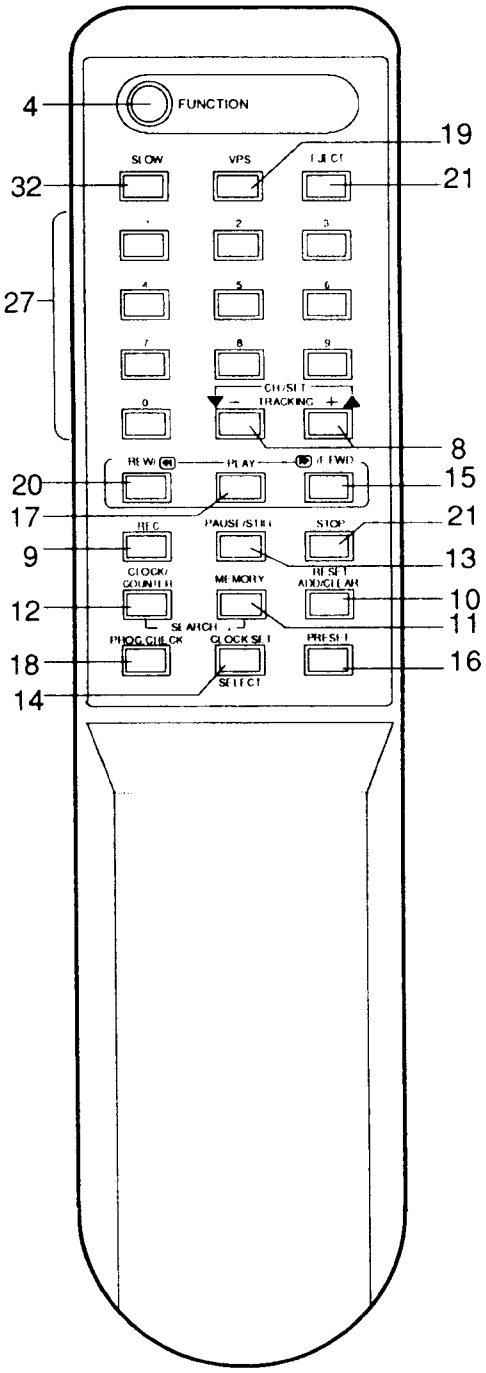
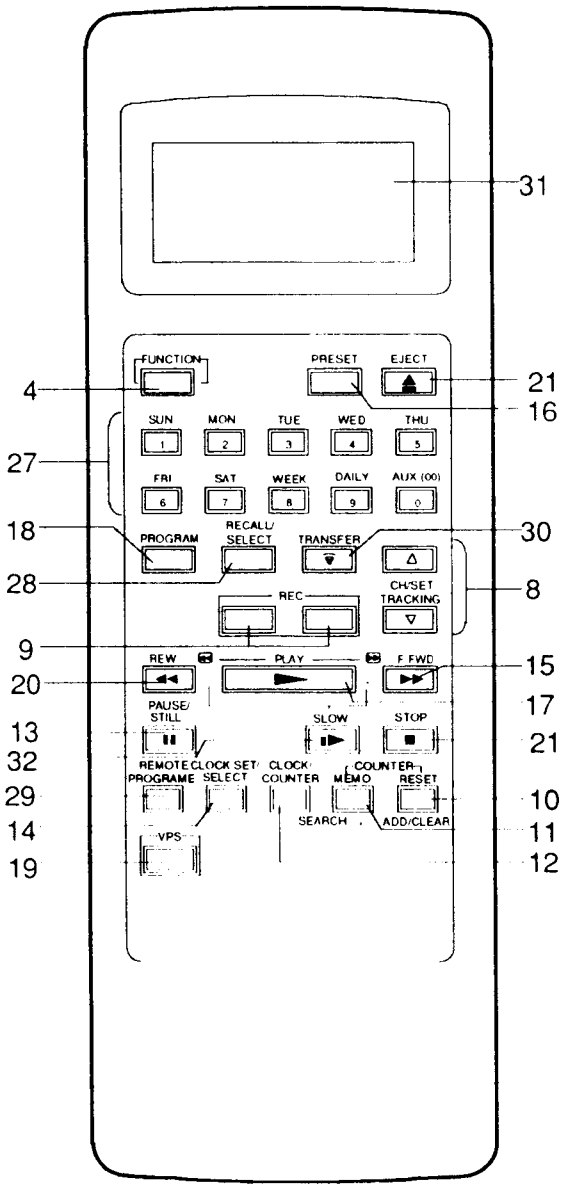
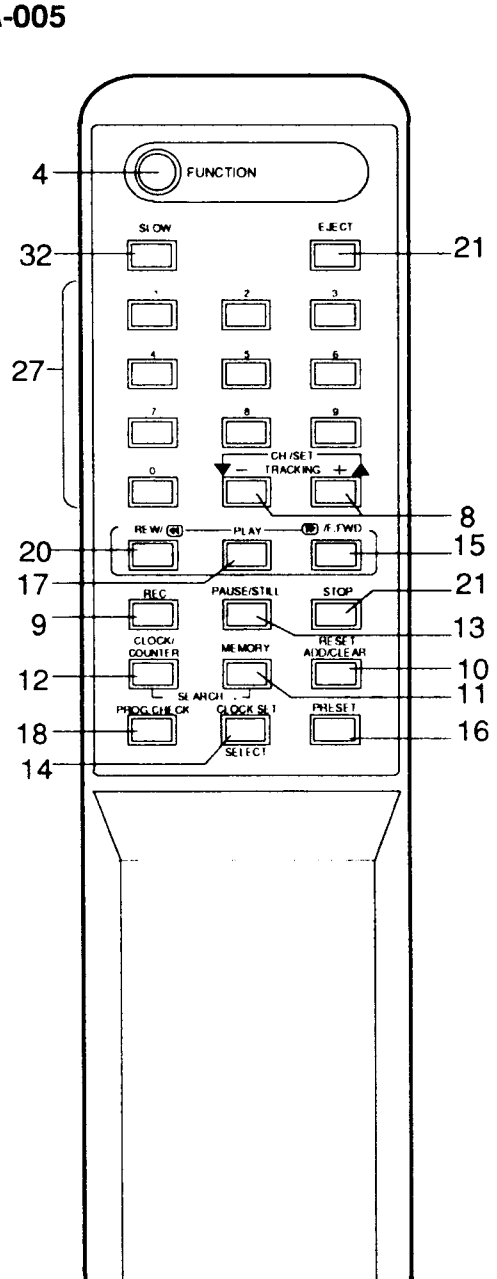

4
FUNCTION
19
SLOW
VPS
EJECT
32
21
27
CH/SET
TRACKING
8
REW
PLAY
F FWD
20
15
17
21
REC
PAUSE/STILL
STOP
9
13
CLOCK/
COUNTER
MEMORY
RESET
ADD/CLEAR
12
10
SEARCH
11
PROG.CLOCK
CLOCK SET
PRESET
18
16
SELECT
14

4A-035

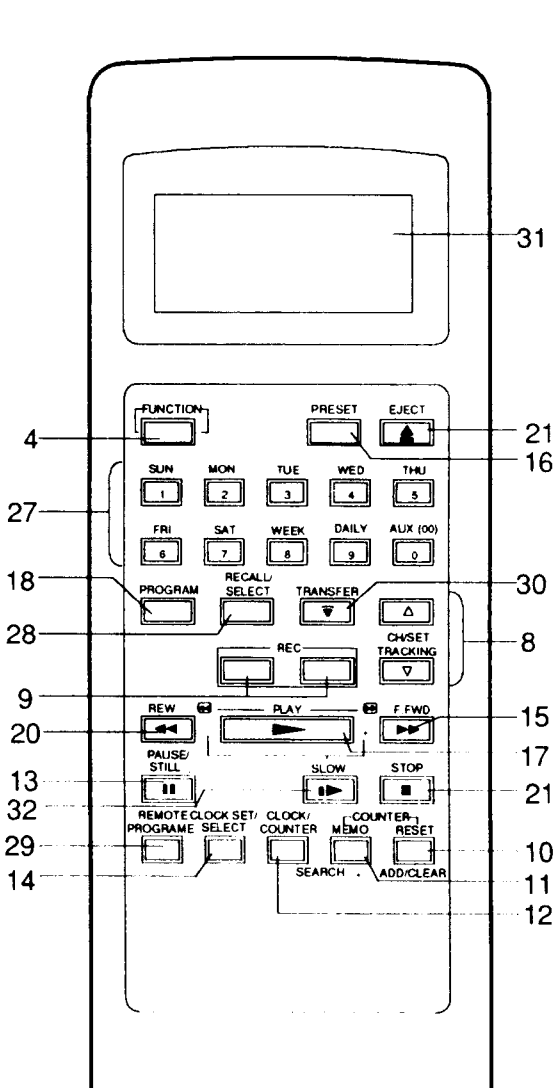

31
FUNCTION
PRESET
EJECT
4
21
16
SUN
MON
TUE
WED
THU
27
FRI
SAT
WEEK
DAILY
AUX (00)
18
PROGRAM
RECALL/
SELECT
TRANSFER
30
28
CH/SET
TRACKING
8
REC
9
REW
PLAY
F FWD
15
20
17
PAUSE/
STILL
SLOW
STOP
13
21
32
REMOTE
PROGRAME
CLOCK SET/
SELECT
CLOCK/
COUNTER
COUNTER
MEMO
RESET
29
10
SEARCH
14
ADD/CLEAR
11
VPS
19
12

REMOTE CONTROL OPERATION

4A-005



4A-015



1 CASSETTE COMPARTMENT
2 REMOTE CONTROL RECEIVER WINDOW– Receives the infrared control signals from the handhold remote control unit.
3 DIGITAL DISPLAY– Display the clock, timer recording, counter and channel etc.
4 FUNCTION button– To turn VCR on and off.
TIMER REC button– Press to activate the automatic recording timer.
5 FINE TUNING buttons– Use these buttons to manually tune in weeker broadcast signals.
6 RESET– Use to reset all programming.
7 PICTURE control– Ajust picture sharpness during playback.
8 CHANNEL buttons– Press to select the channel for viewing or recording.
TRACKING control buttons– Adjust to minimize video 'noise' (lines or dots on screen) during playback.
SET buttons– Adjust time with "+"or"-" button.
9 REC/OTR button– Press to begin manual recording and activate one touch recording mode.

10 RESET button– Press to reset counter to 0000.
ADD/CLEAR button– Press to cancel memorized channel or Timer Programme, and to add cancelled channel.
11 MEMORY button– Press to set memory-in.
SEARCH [+] button– Press to search up TV channel.
12 CLOCK/COUNTER button– Press to alternate between clock and counter display modes.
SEARCH [-] button– Press to search down TV channel.
13 PAUSE/STILL button– Press to temporarily stop tape during playback or manual recording.
14 CLOCK SET button– Use to select clock setting mode.
SELECT button– Use to select timer setting mode.
BAND selector button– Press to select channel range. (VL/VH/U)
15 F.FWD button– Press to advance tape faster than normal or to view video in forward direction during play mode at a faster than normal speed. Press PLAY button to return VCR to normal playback speed.
16 PRESET button– Use to select channel memory mode.
17 PLAY button– Press to begin playback of a tape.
18 PROG. CHECK button– Press to select programme number.
19 VPS button– Use for timer recording. (4A-025, 4A-035, 6A-025, 6A-035 only)
20 REWIND button– Press to rewind tape, or to view video in reverse during play mode at a faster than normal speed. Press PLAY button to return VCR to normal playback speed.
21 STOP/EJECT button– Press to stop tape motion and remove tape from VCR.
22 RF CHANNEL adjustment– Preset to UHF channel 37 prior to shipment. This should be adjusted only if interference is present due to another transmission on this channel.
23 RF OUT socket– Connect to aerial socket on your TV.
24 AERIAL socket– Connect to a UHF aerial.
25 TEST SIGNAL switch– Turn this switch on and check that the video channel of your TV set is correct.
26 AUDIO/VIDEO socket– Connect to audio/video socket of a video camera or another VCR.
27 NUMBER buttons– To select desired channels, week, day, and hours/minutes when making a timer recording. They cannot be used to set desired channel during Timer Recording. If you want to select channel among 1 to 9, first 0 button and then press desired button among 1 to 9.
28 RECALL/SELECT button– Press to return the display before the next step and correct the recording information.
29 REMOTE PROGRAM button–
30 TRANSFER button– To transfer the recording information into the memory of the main unit.
31 LIQUID CRYSTAL DISPLAY(LCD)
32 SLOW button– Press in playback for slow motion.

DISASSEMBLY INSTRUCTIONS [CABINET]

1-1. Bottom Plate Removal

Remove 3 Screws (S-1).
Slide the Bottom Plate in the direction of the arrow.
Remove 8 Locking Tabs (L-1). (Fig.1)

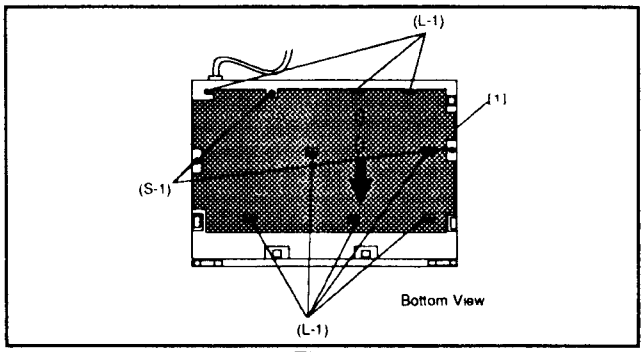


Fig. 1

1-2. Top Case Removal

Remove 1 Screws (S-2).

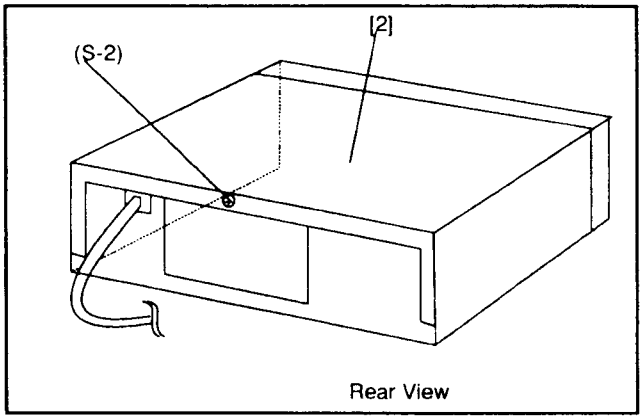


Fig. 2

1-3. Front Ass'y Removal

Remove 2 Screws (S-3).
Release 7 Locking Tabs (L-2).(Fig. 3).

Note:

When you reinstall the Front Ass'y, take care not to break the Locking Tabs. First install the Locking Tab (A), then install the Locking Tab (B), holding up the the Cassette Door Lift (Fig. 4).

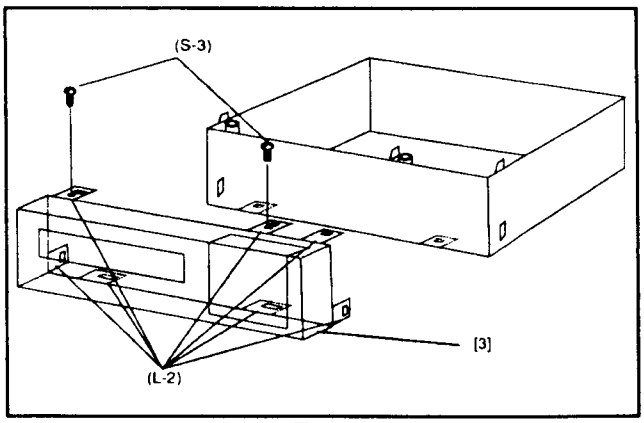


Fig. 3

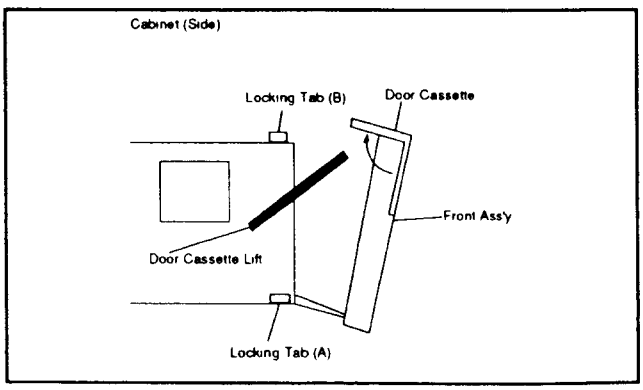


Fig. 4

1-4. Control P.C.B. Removal

Release 2 Locking Tabs (L-3).
Disconnect 2 Connectors. (Fig. 5)

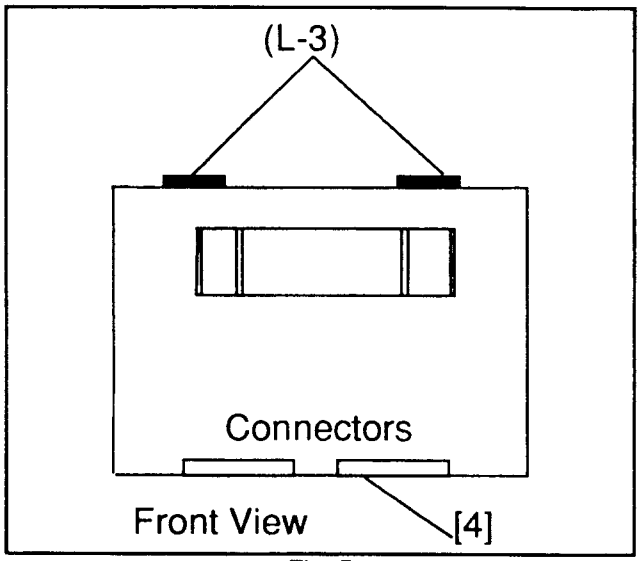


Fig. 5

1-5. Deck Ass'y Removal

Remove 2 Screws (S-5).
Remove the Deck Support Plate.
Remove 4 Screws (S-4).
Disconnect the 2 Connectors. (Fig. 6)

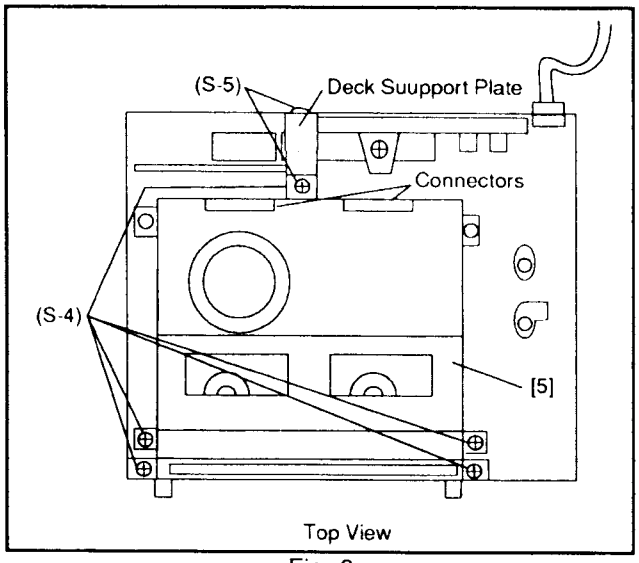


Fig. 6

1-6. Main P.C.B. Removal

Remove Screw (S-6).
Release 3 Locking Tabs (L-4) and 3 Locking Tabs (L-5). (Fig. 7)

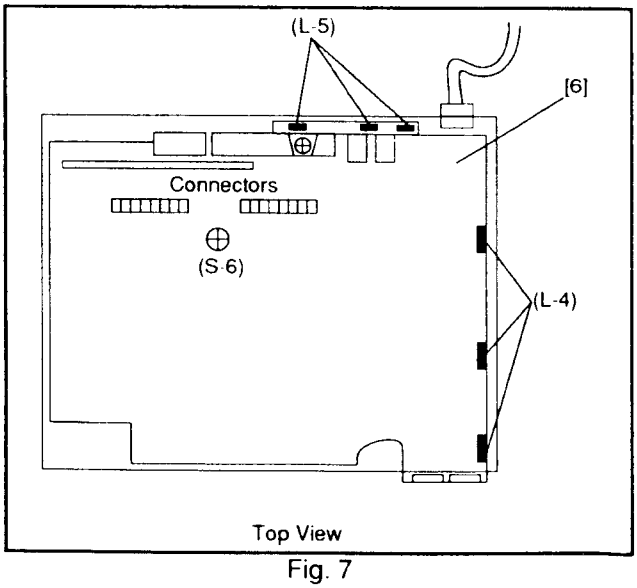
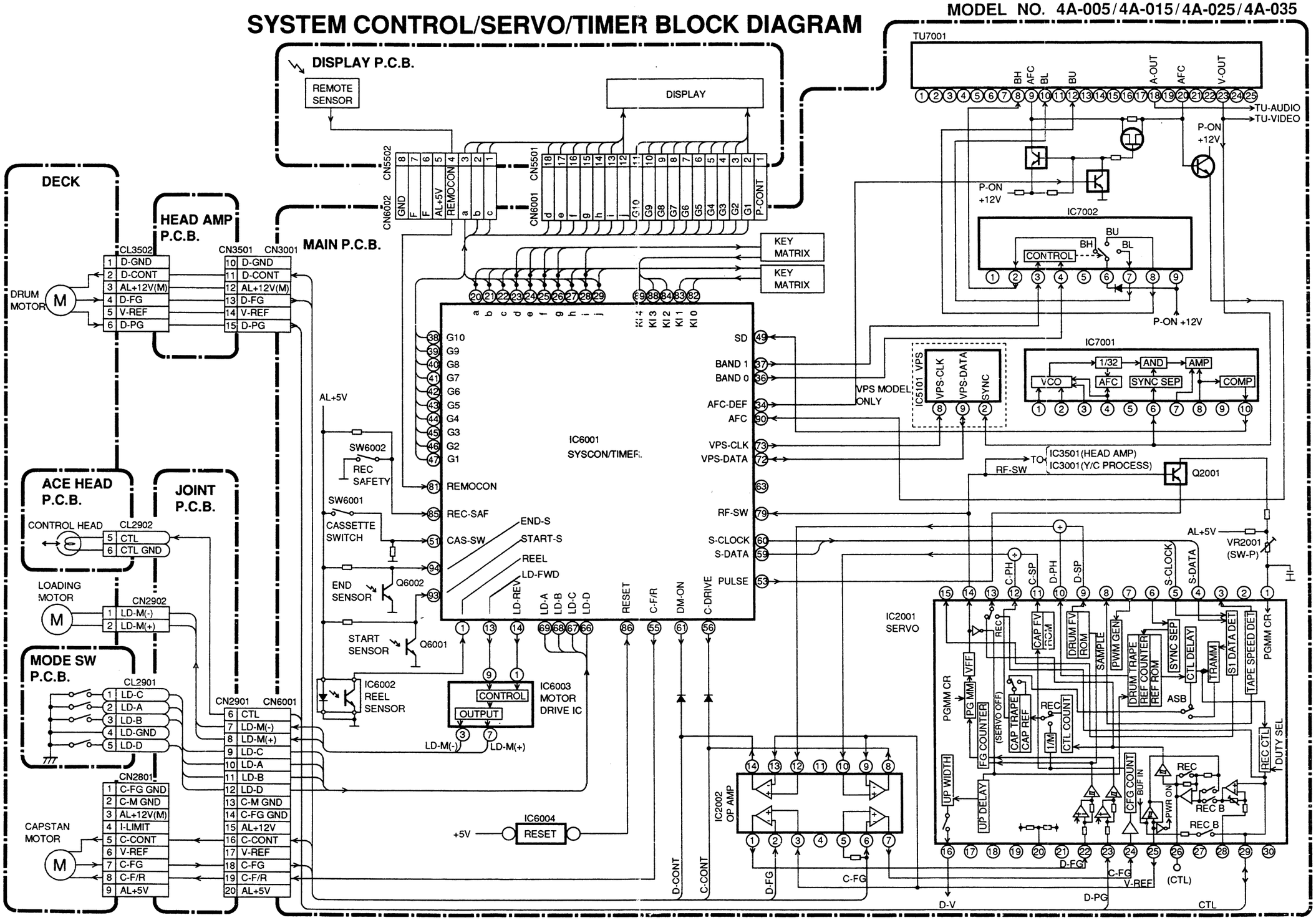


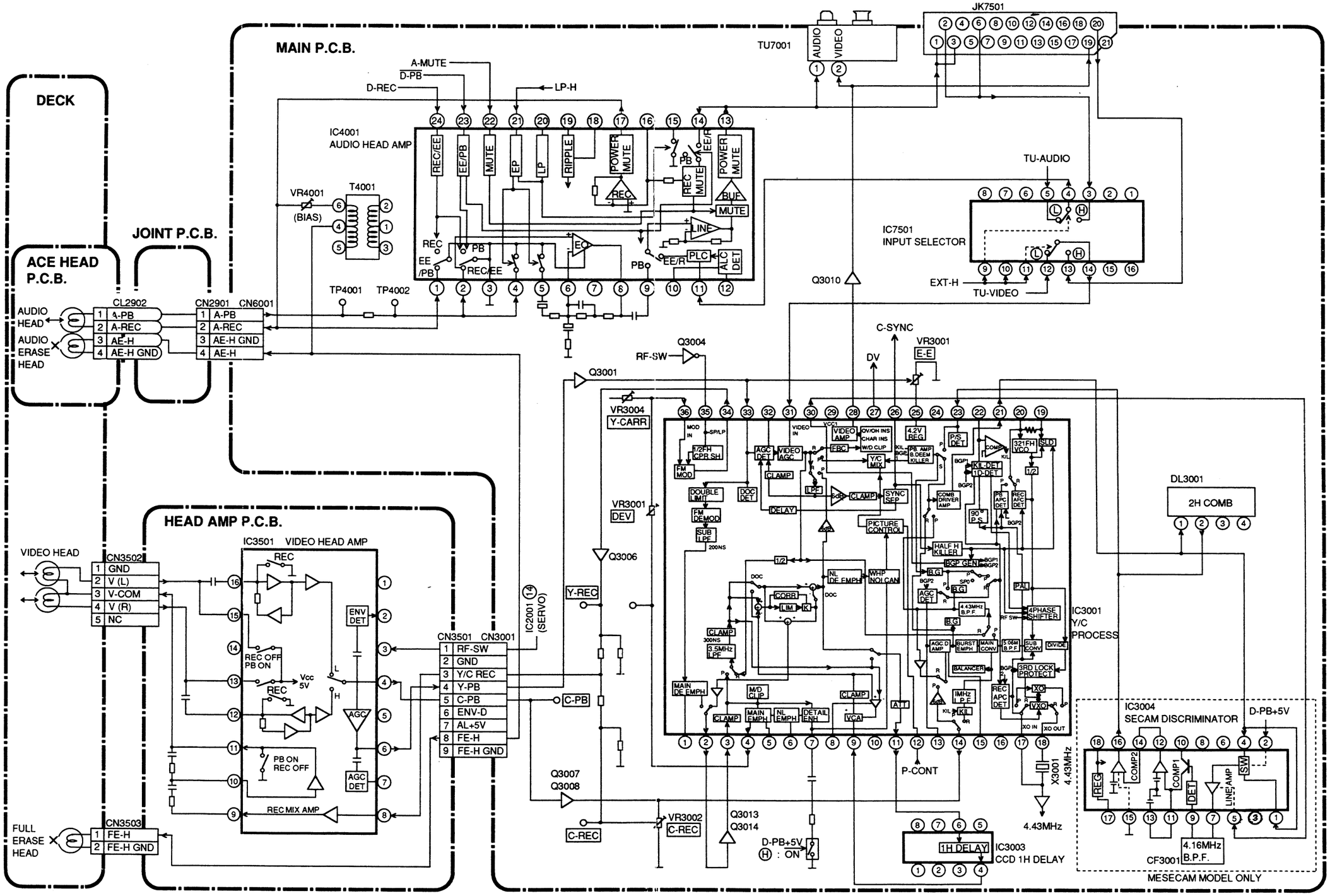
Fig. 7

SYSTEM CONTROL/SERVO/TIMER BLOCK DIAGRAM

MODEL NO. 4A-005/4A-015/4A-025/4A-035



VIDEO/AUDIO BLOCK DIAGRAM



K8030-BLV

ELECTRICAL ADJUSTMENT INSTRUCTIONS

NOTE:
Electrical adjustment are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

TEST EQUIPMENT REQUIRED

1. Oscilloscope: Dual-trace with 10:1 probe.
2. TV Monitor
3. Pattern Generator (Color bar with 100% white)
4. AC Voltmeter (RMS)
5. Test Tape F6-A, F5-A
6. Spectrum Analyzer, Frequency Counter

HEAD SWITCHING POSITION ADJUSTMENT

Purpose:

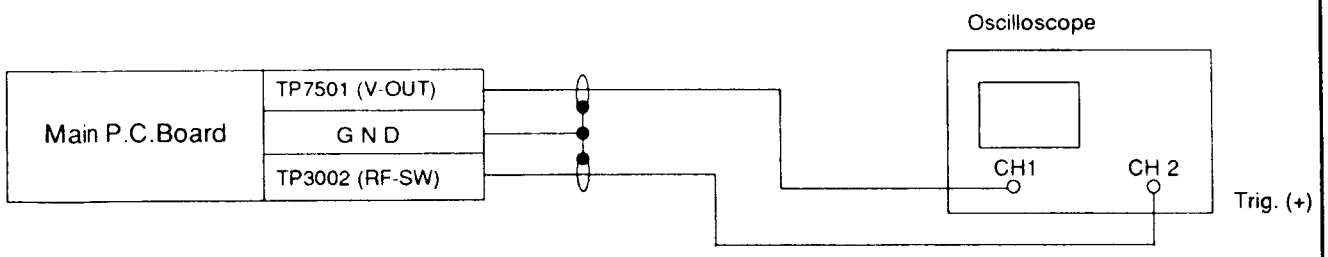
Determine the Head Switching Point during Playback.

Symptom of Misadjustment:

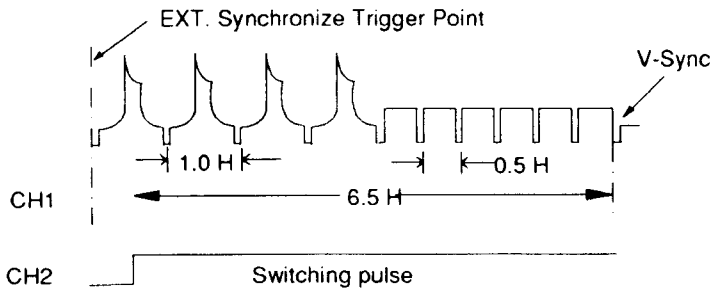
May cause Head Switching Noise or Vertical Jitter in the picture.

Test Point	Adj. Point	Mode	Input
TP7501 (V-OUT) TP3002 (RF-SW) GND	VR2001 (Switching Point) (Main P.C.Board)	PLAY (SP)	—
Tape	M. EQ.	Spec.	
F6-A	Oscilloscope	T=6.5H(416µs)	

Connections of M. EQ.



Figure



Reference Notes:

1. Connect equipments as shown in the above table.
2. Adjust the Tracking control to its center position. Press + and – of Tracking control Button at same time.
3. Playback the test tape and adjust VR2001 so that the V-sync front edge of CH1 video output waveform is delayed 6.5H(416µs) from the rising of CH2 Head Switching pulse waveform.

E-E LEVEL ADJUSTMENT

Purpose:

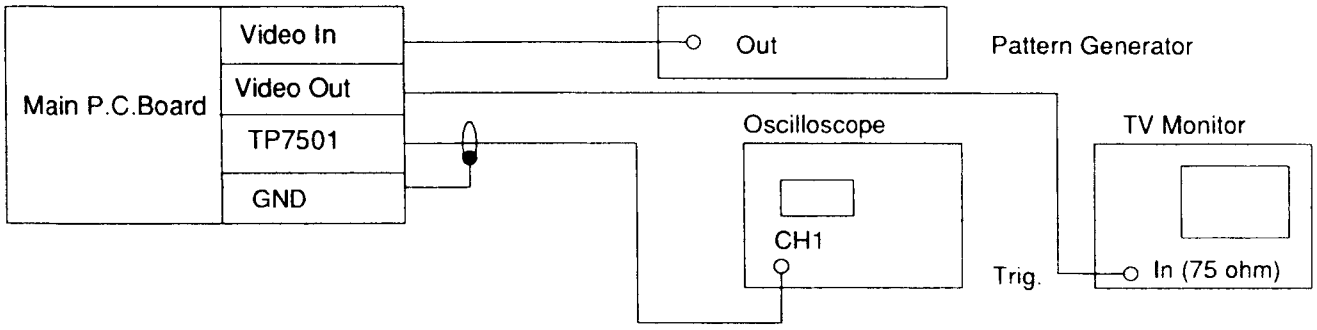
Set the optimum E-E Luminance Level.

Symptom of Misadjustment:

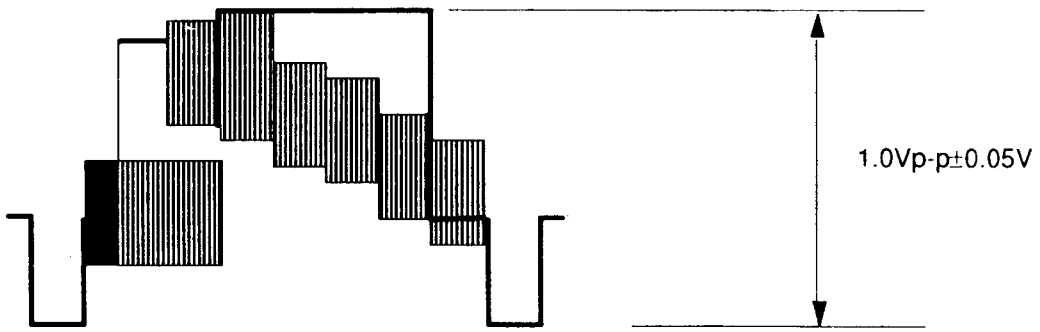
If the E-E Level is too high, TV may overload. If the Level is too low, the S/N Ratio deteriorates.

Test Point	Adj. Point	Mode	Input
TP7501 (V-OUT) GND	VR3003 (Main P.C.Board)	E-E	Color Bar signal with 100% White
Tape	M. EQ.	Spec.	
----	Pattern Generator TV Monitor Oscilloscope	1.0Vp-p±0.05V	

Connections of M. EQ.



Figure



Reference Notes:

1. Connect equipments as shown in the above table.
2. Input Color Bar signal with 100% White to Video Input.
3. Adjust VR3003 so that the video level becomes 1.0Vp-p±0.05V.

FM CARRIER DEVIATION ADJUSTMENT

Purpose:

To align FM carrier deviation.

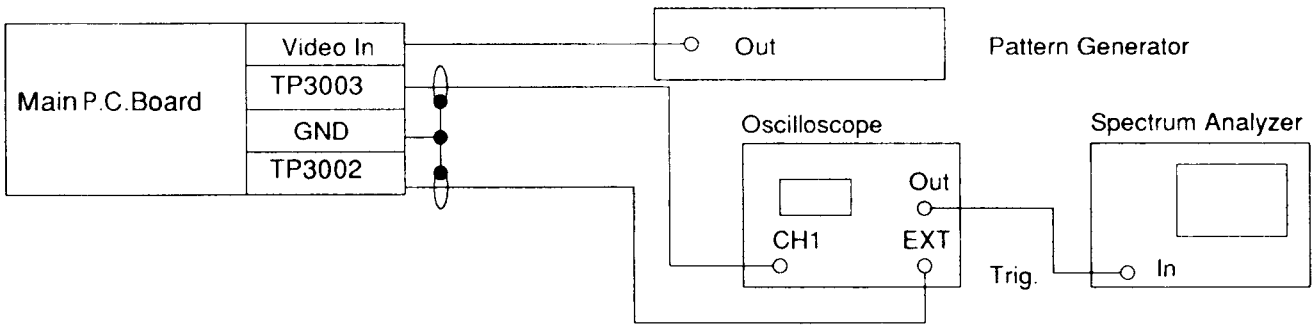
Symptom of Misadjustment:

If the deviation is not correct, abnormal contrast of light and shadow on the picture may be seen.

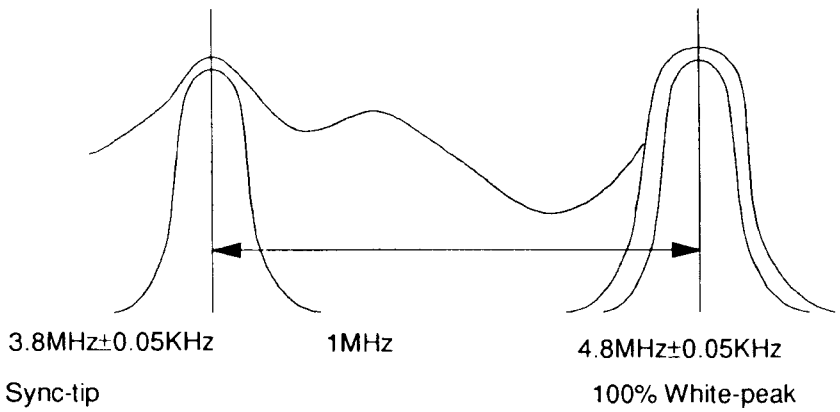
If the carrier deviation is not correct, Beats appear on the picture.

Test Point	Adj. Point	Mode	Input
TP3003 (Y-REC) TP3002 (RF-SW)	VR3004 (CRR) VR3001 (DEV) (Main P.C.Board)	REC (SP)	Color Bar signal with 100% White
Tape	M. EQ.	Spec.	
Blank Tape	Pattern Generator Spectrum Analyzer Oscilloscope	Sync-tip 3.8MHz±0.05MHz White-peak 4.8MHz±0.05MHz	

Connections of M. EQ.



Figure



Reference Notes:

1. Connect equipments as shown in the above table.
2. Input Color Bar signal with 100% White to Video Input.
3. Adjust Sync-tip to 3.8MHz±0.05MHz by VR3004, White-peak to 4.8MHz±0.05MHz by VR3001.

REC. CURRENT ADJUSTMENT

Purpose:

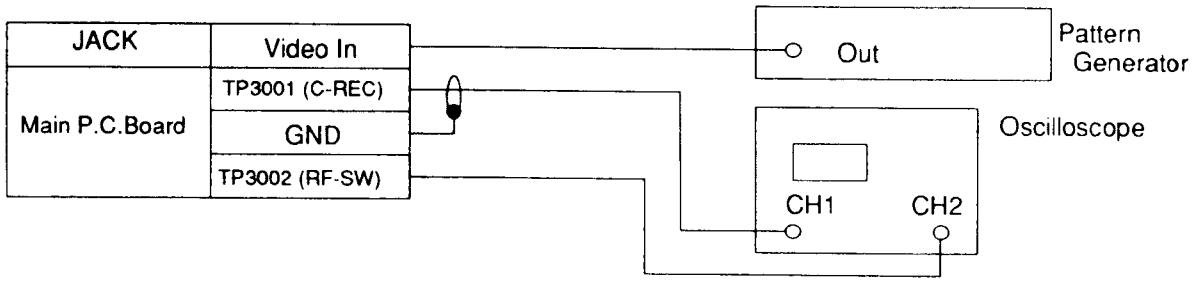
Set the optimum Record Chroma and Luminance Levels.

Symptom of Misadjustment:

If the Record Chroma Level is too high, beats may cause on the picture, and in case of too low, the Chroma S/N Ratio will be lower. If the Record Luminance Level is too high, Video may overload, and in case of too low, S/N Ratio deteriorates.

Test Point	Adj. Point	Mode	Input
TP3001 (C-REC) TP3002 (RF-SW)	VR3002 (Main P.C.Board)	REC	Red only
Tape	M. EQ.	Spec.	
Blank Tape	Pattern Generator Oscilloscope	Chroma 75mVp-p±5mV	

Connections of M. EQ.



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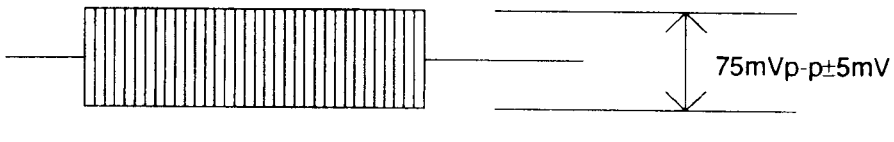


Reference Notes:

1. Connect equipments as shown in the above table.
2. Input Red only signal to Video Input.
3. Adjust VR3002 so that chroma level becomes 75mVp-p±5mV.

REC. BIAS CURRENT ADJUSTMENT

Purpose:

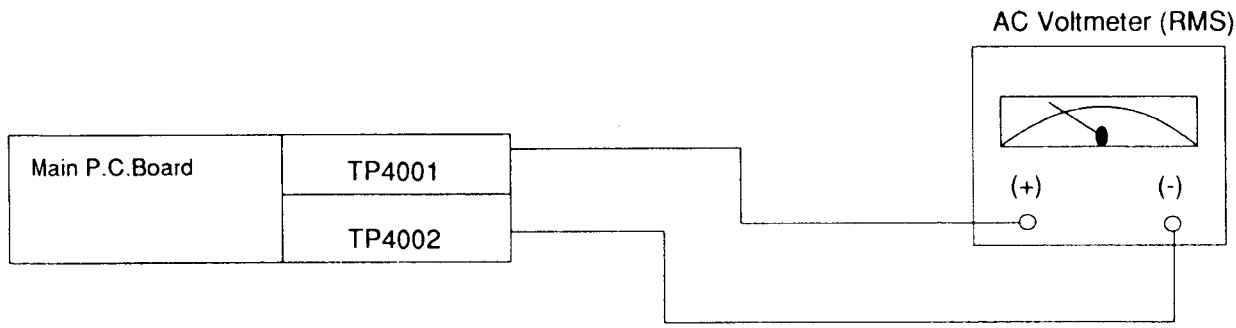
Set Optimum Record Audio Bias Level.

Symptom of Misadjustment:

If Audio Bias Level is too high, the Frequency Responce deteriorates. If the level is too low, sound distortion may cause.

Test Point	Adj. Point	Mode	Input
TP4001 (BIAS +) TP4002 (BIAS –)	VR4001 (BIAS) (Main P.C.Board)	REC (SP)	—
Tape	M. EQ.	Spec.	
Blank Tape	AC Voltmeter (RMS)	22±2mV RMS	

Connections of M. EQ.



Reference Notes:

1. Connect equipments as shown in the above table.
2. Insert a blank tape and set the VCR to REC mode.
   (Do not set to PAUSE mode, the bias oscillation is stopped.)
3. Adjust VR4001 so that the voltage becomes 22±2mV.

SECAM 1/2f COIL ADJUSTMENT

Purpose:

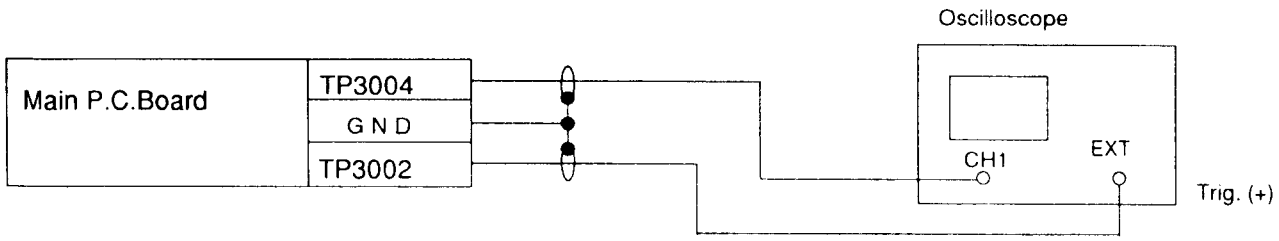
To detect SECAM Signal Correctly.

Symptom of Misadjustment:

Black and White Picture only appears if SECAM Signal is Low Level.

Test Point	Adj. Point	Mode	Input
TP3004 (SECAM, CH1) TP3002 (RF-SW)	T3001 (MESECAM) (Main P.C.Board)	PLAY	—
Tape	M. EQ.	Spec.	
F5-A	Oscilloscope	See below.	

Connections of M. EQ.



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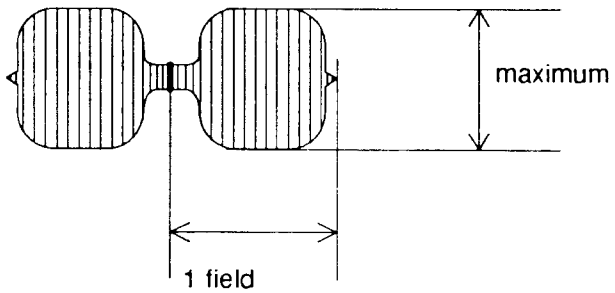


Reference Notes:

1. Connect equipments as shown in the above table.
2. Adjust T3001 so that output level becomes maximum.

Note: Require this adjustment for MESECAM mode only.

REC. BIAS CURRENT ADJUSTMENT

Purpose:

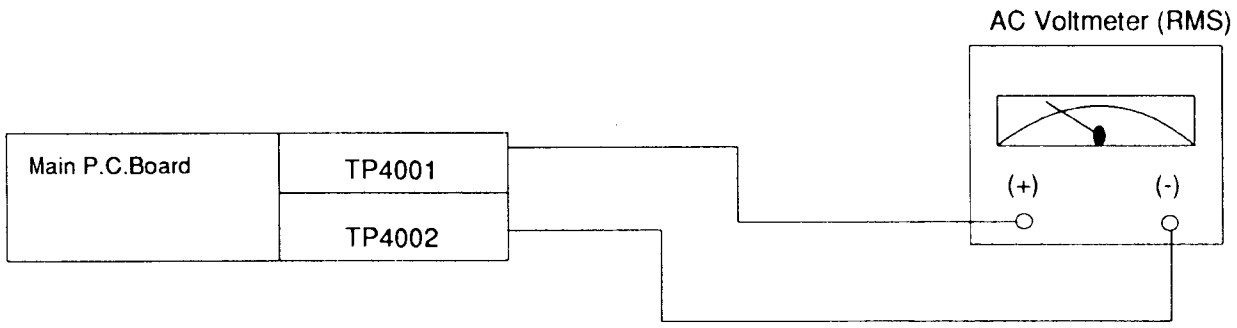
Set Optimum Record Audio Bias Level.

Symptom of Misadjustment:

If Audio Bias Level is too high, the Frequency Responce deteriorates. If the level is too low, sound distortion may cause.

Test Point	Adj. Point	Mode	Input
TP4001 (BIAS +) TP4002 (BIAS –)	VR4001 (BIAS) (Main P.C.Board)	REC (SP)	—
Tape	M. EQ.	Spec.	
Blank Tape	AC Voltmeter (RMS)	22±2mV RMS	

Connections of M. EQ.



Reference Notes:

1. Connect equipments as shown in the above table.
2. Insert a blank tape and set the VCR to REC mode.
   (Do not set to PAUSE mode, the bias oscillation is stopped.)
3. Adjust VR4001 so that the voltage becomes 22±2mV.

SECAM 1/2f COIL ADJUSTMENT

Purpose:

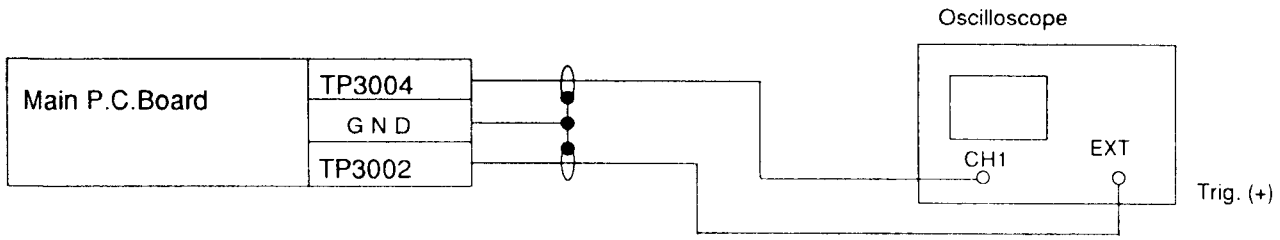
To detect SECAM Signal Correctly.

Symptom of Misadjustment:

Black and White Picture only appears if SECAM Signal is Low Level.

Test Point	Adj. Point	Mode	Input
TP3004 (SECAM, CH1) TP3002 (RF-SW)	T3001 (MESECAM) (Main P.C.Board)	PLAY	—
Tape	M. EQ.	Spec.	
F5-A	Oscilloscope	See below.	

Connections of M. EQ.



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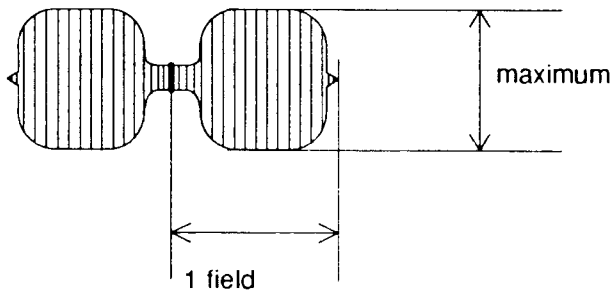


Reference Notes:

1. Connect equipments as shown in the above table.
2. Adjust T3001 so that output level becomes maximum.

Note: Require this adjustment for MESECAM mode only.

SCHEMATIC DIAGRAMS / C. B. A. AND TEST POINTS

STANDARD NOTES

WARNING

Critical components having special safety characteristics are identified with a ⚠ by the Ref. No. in the parts list and enclosed within a broken line * (where several critical compornents are grouped in one area) along with the safety symbol ⚠ on the schematics or exploded views.
Use of substitute replacement parts which do not have the same specified safety characreristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Philips Consumer Electronics Company. Philips assumes no liability, express or implied, arising out of any unauthorized modification of design. Servicer assumes all liability.

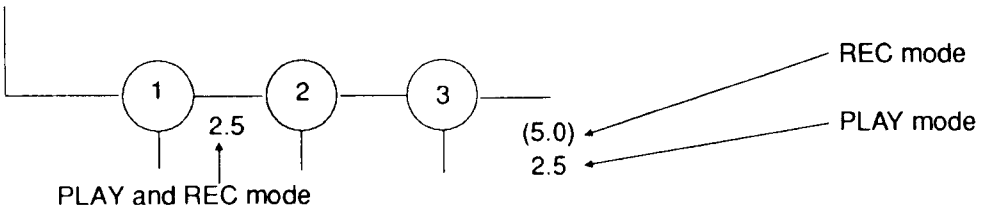
*Broken Line:

Notes :

① Do not use the part number shown on these drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since these drawings were prepared.
② All resistance values are indicated in ohms ($K=10^3$, $M=10^6$).
③ Resistor wattages are 1/5W or 1/6W unless otherwise specified.
④ All capacitance values are indicated in μF ($P=10^{-6}\mu F$).
⑤ All voltages are DC voltages unless otherwise specified.
⑥ Voltage Indications for PB and STOP mode on Schematics are as shown below.

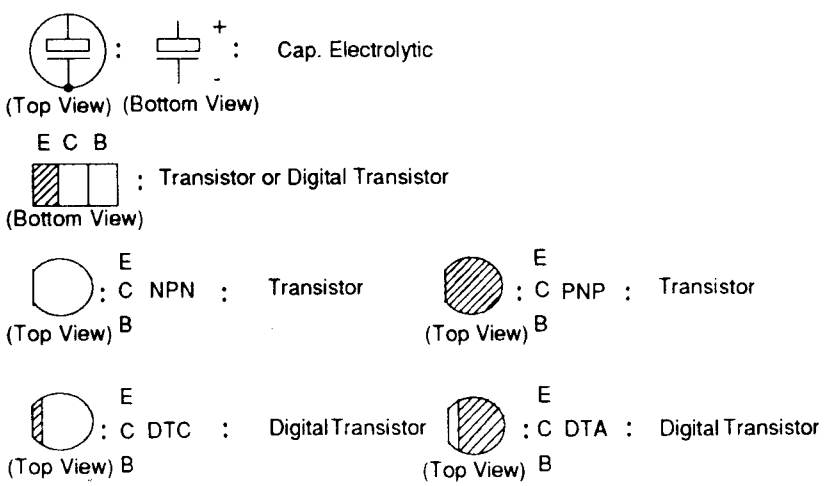
Capacitor Temperature Markings

Mark	Capacity change rate	Standard temperature	temperature range
(B)	±10%	20°C	-25~+85°C
(F)	+30 -80%	20°C	-25~+85°C
(SR)	±15%	20°C	-25~+85°C
(Z)	+30 -80%	20°C	-10~+70°C



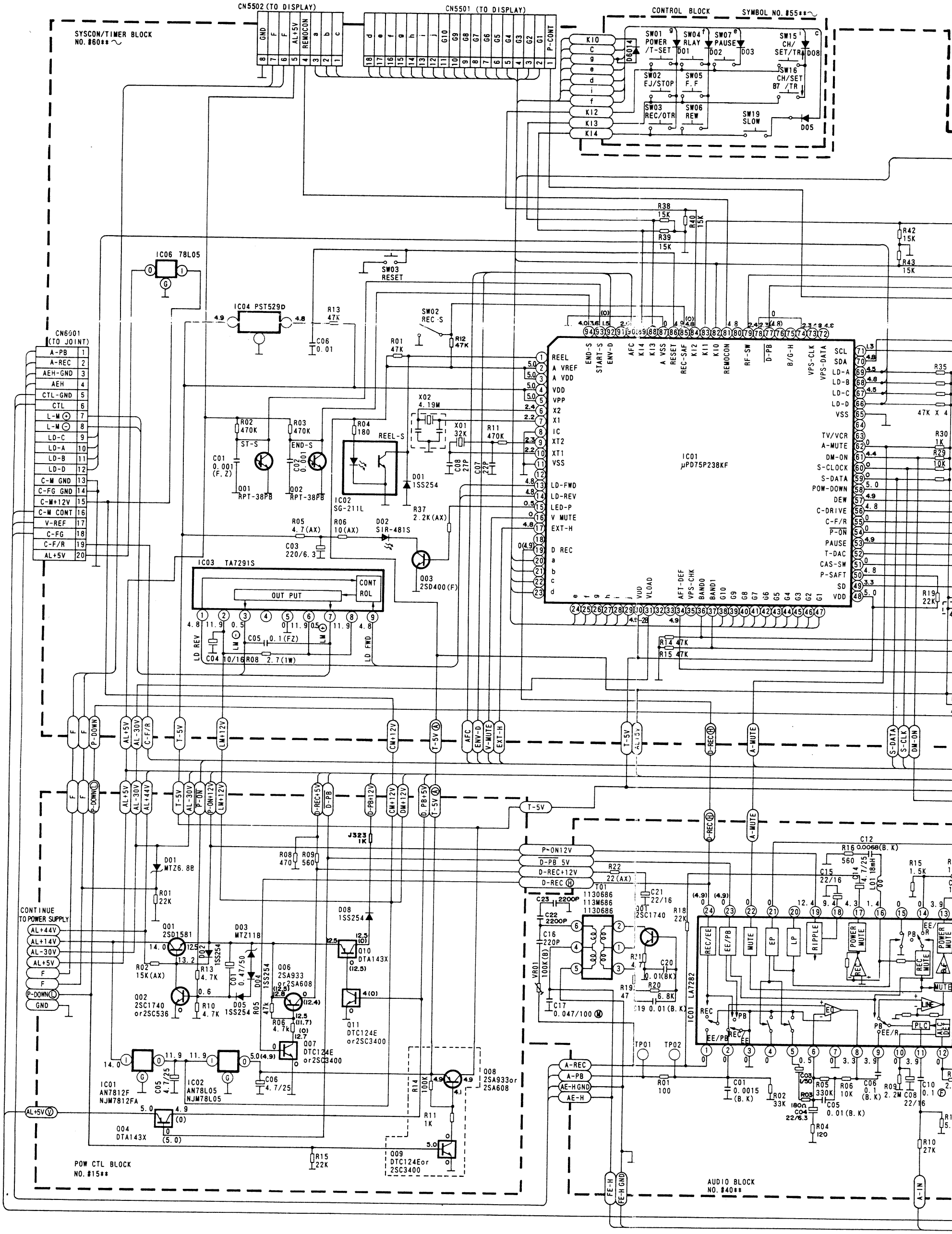
PLAY and REC mode
(Voltage of PLAY and REC mode are the same.)

☆ Capacitors and transistors are noted with the following symbols.



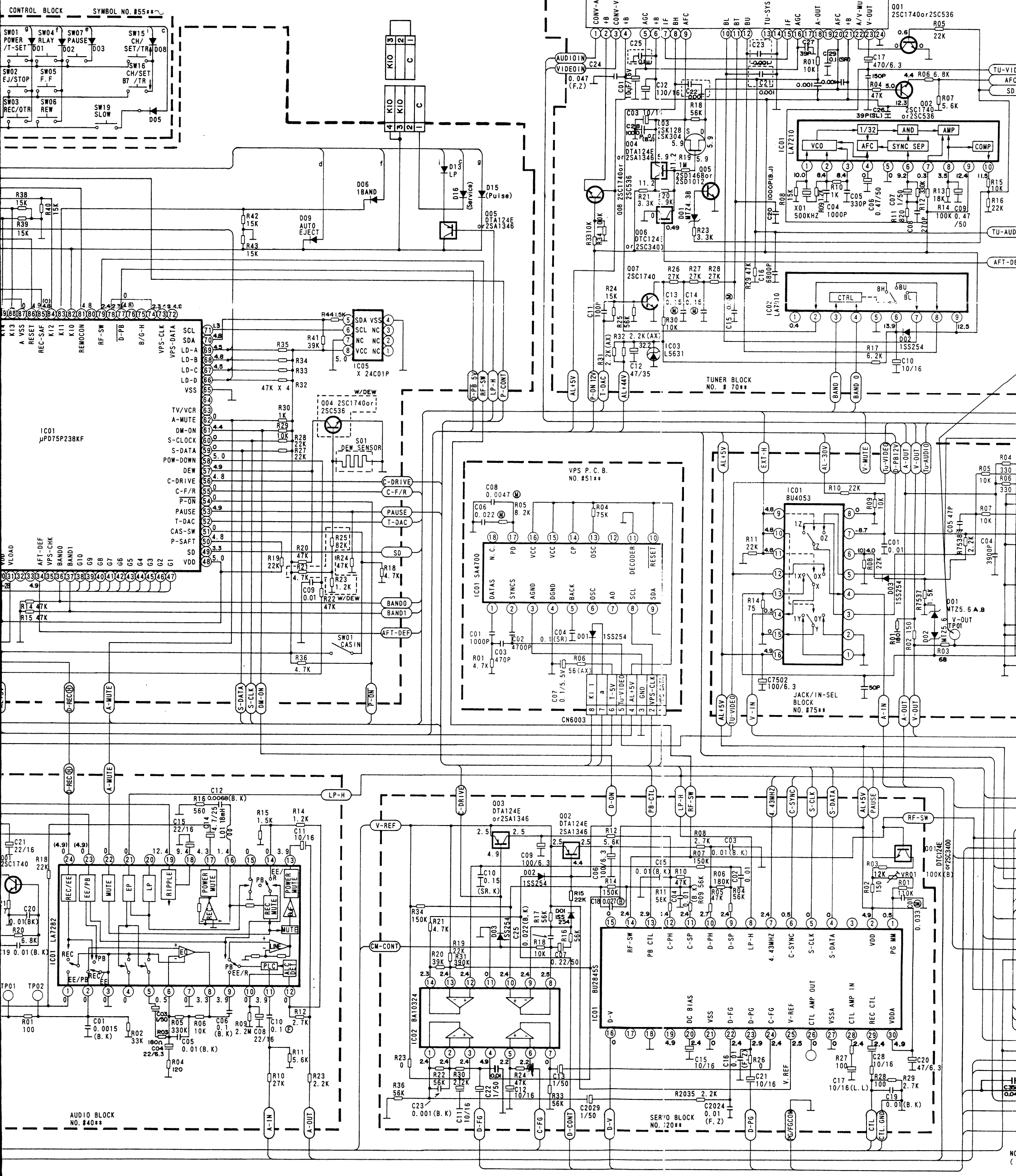
MAIN SC

MODEL NO. 4A



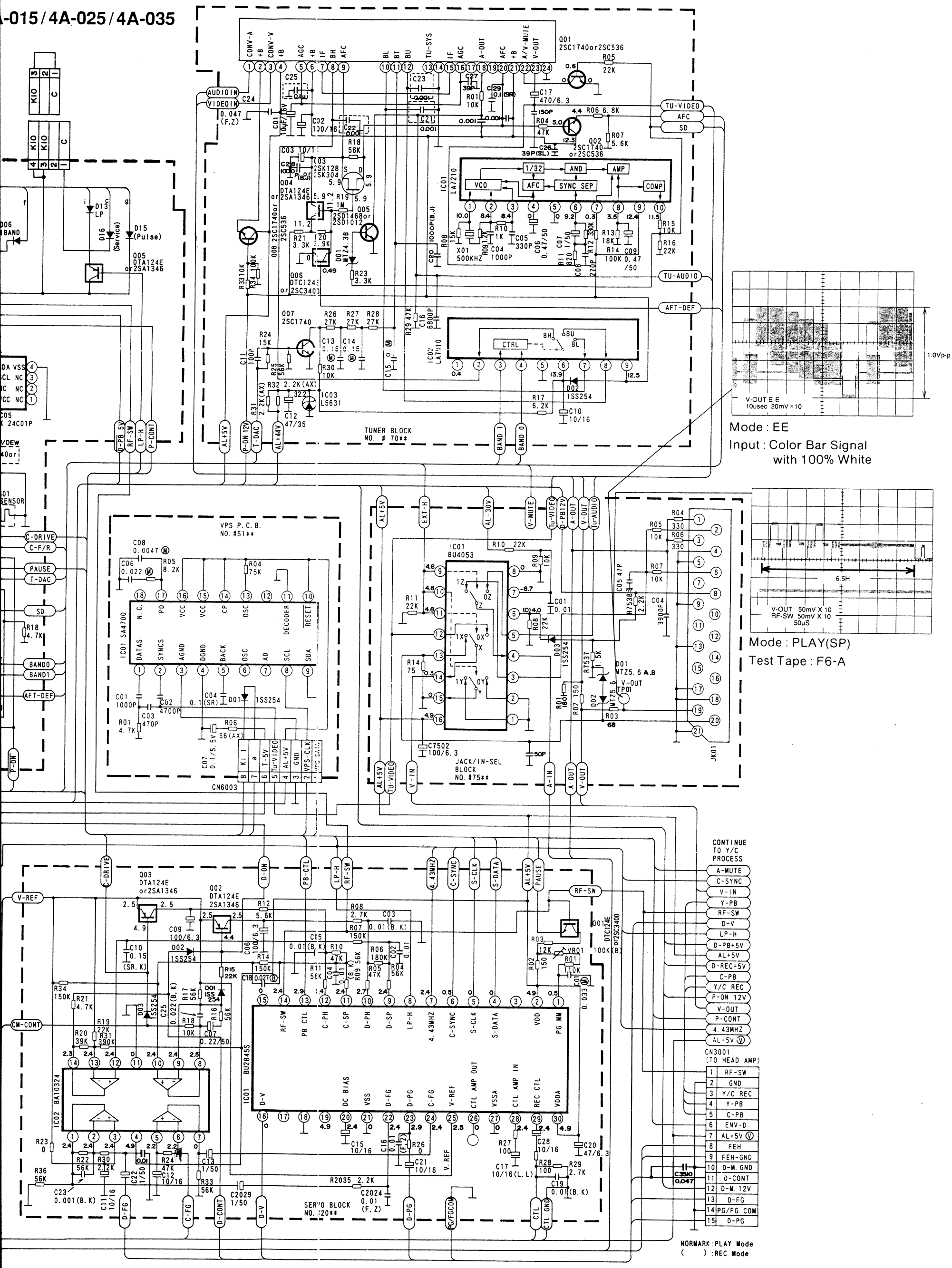
MAIN SCHEMATIC DIAGRAM

MODEL NO. 4A-005/4A-015/4A-025/4A-035



C DIAGRAM

-015/4A-025/4A-035



Mode : EE
Input : Color Bar Signal
with 100% White

Mode : PLAY(SP)
Test Tape : F6-A

NOTE

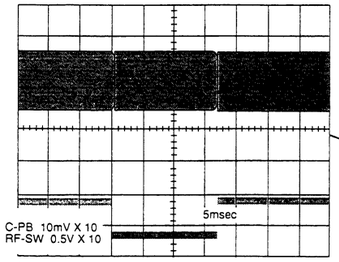
Y / C PROCESS SCHEMATIC DIAGRAM

SYMBOL NO. #30** ~

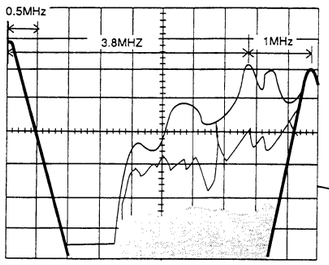
*NOTE:

C49	C75		C49	C75
0.047(B.K)	X	or	0.022(B.K)	0.022(B.K)

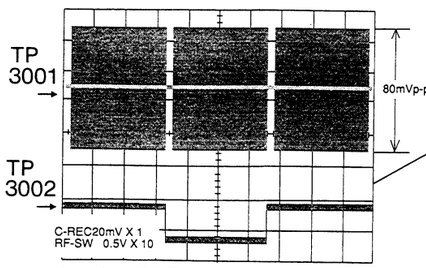
C50	C76		C50	C76
0.047(B.K)	X	or	0.022(B.K)	0.022(B.K)



Mode : PLAY
Test Tape : F6-A



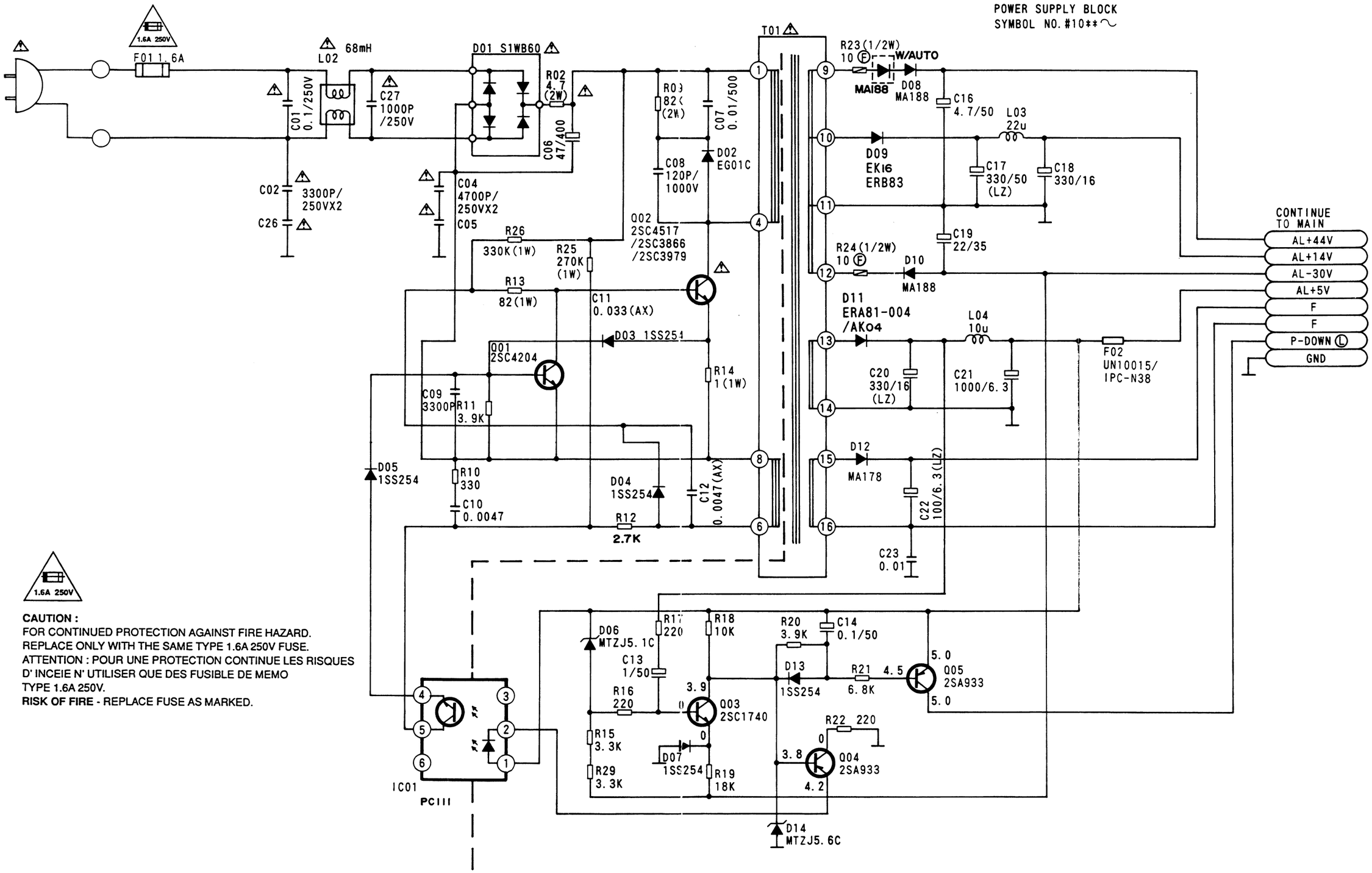
Mode : REC(SP)
Input : Color Bar Signal
with 100% White



Mode : REC
Input : RED ONLY Signal

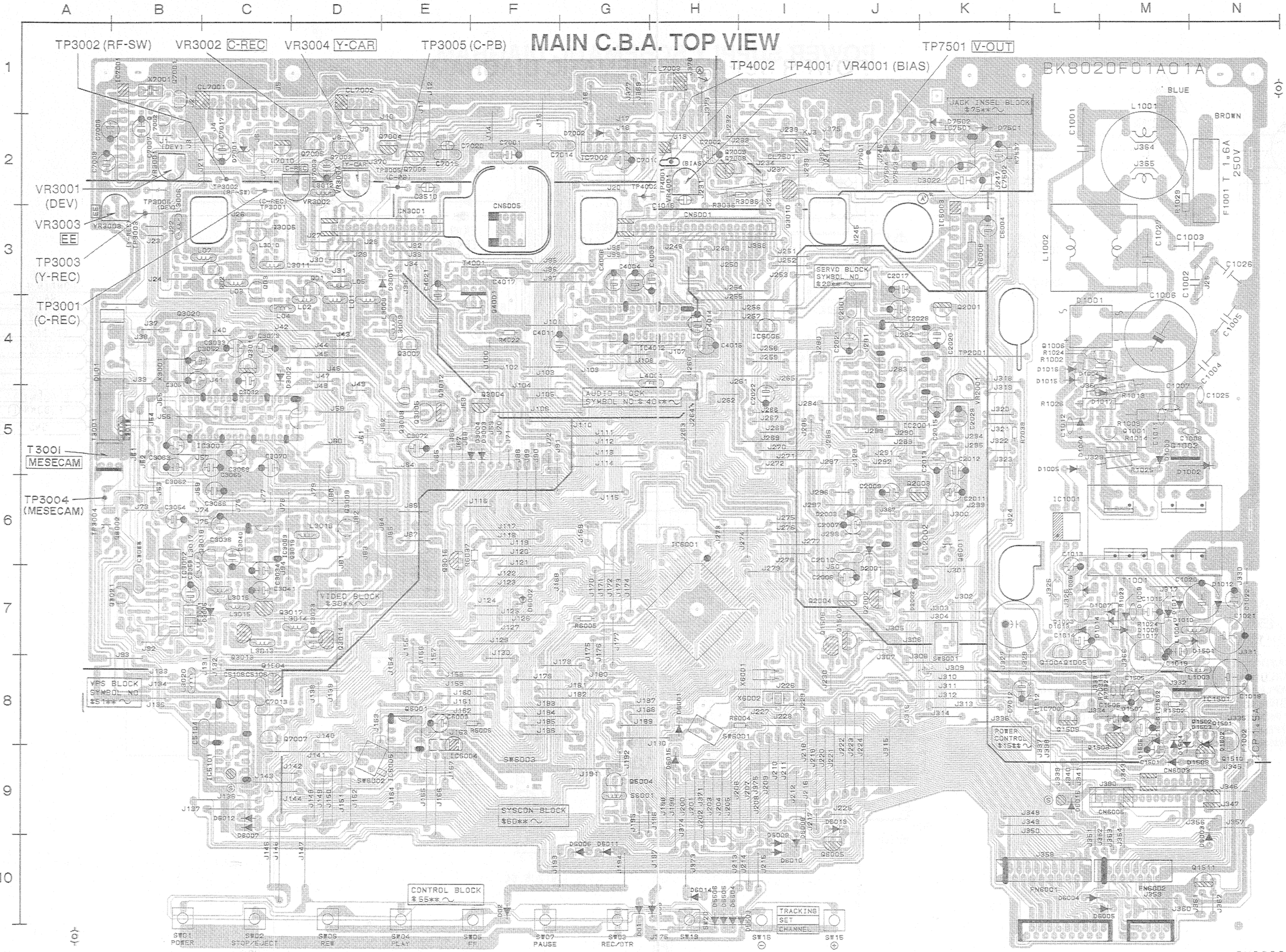
NOR MARK:PLAY Mode
( ):REC Mode

POWER SUPPLY SCHEMATIC DIAGRAM



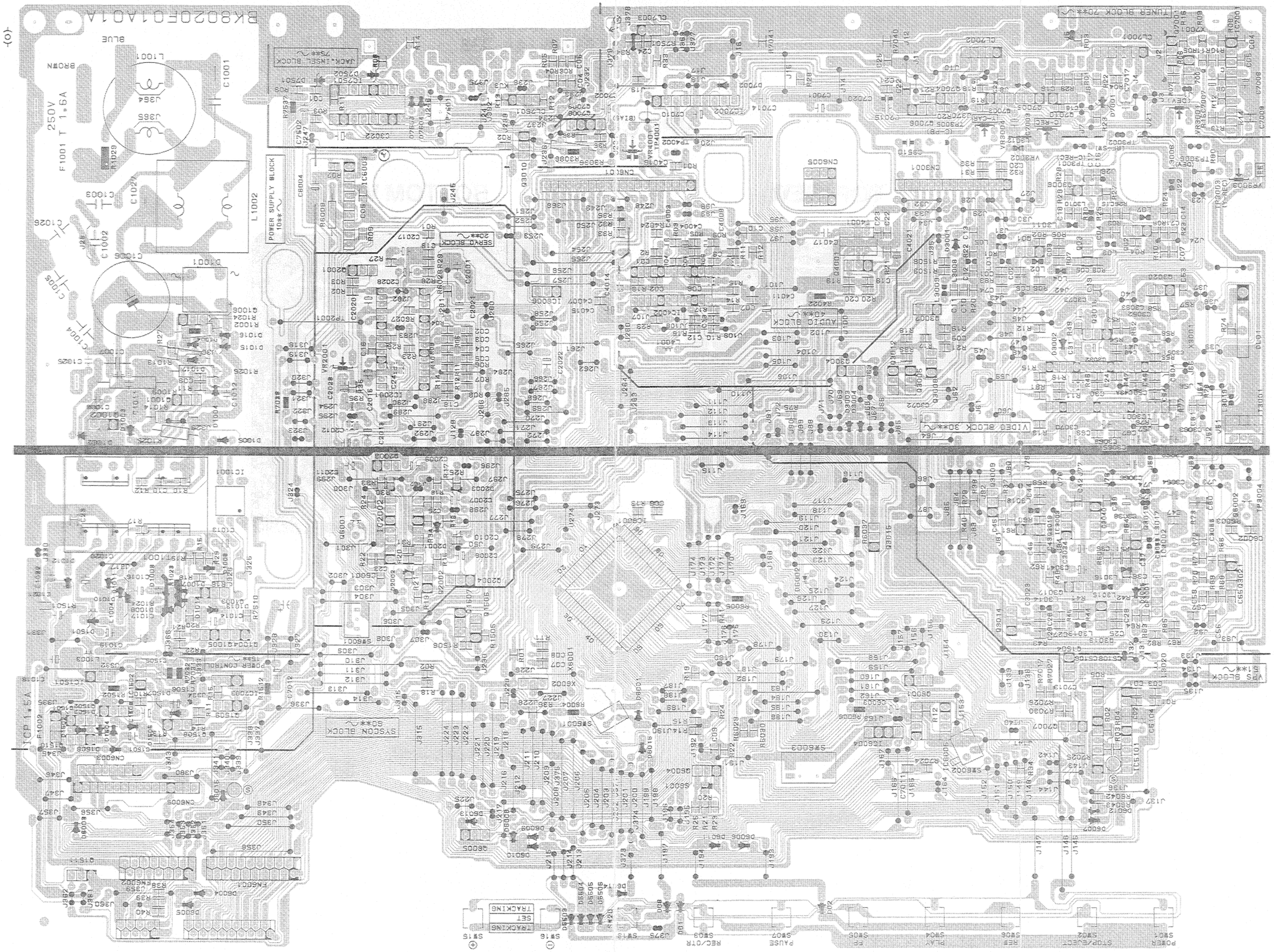
CAUTION :
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD.
REPLACE ONLY WITH THE SAME TYPE 1.6A 250V FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQUES
D' INCEIE N' UTILISER QUE DES FUSIBLE DE MEMO
TYPE 1.6A 250V.
RISK OF FIRE - REPLACE FUSE AS MARKED.

MAIN C.B.A. TOP VIEW



BK8020F01A01A

MAIN C.B.A. BOTTOM VIEW

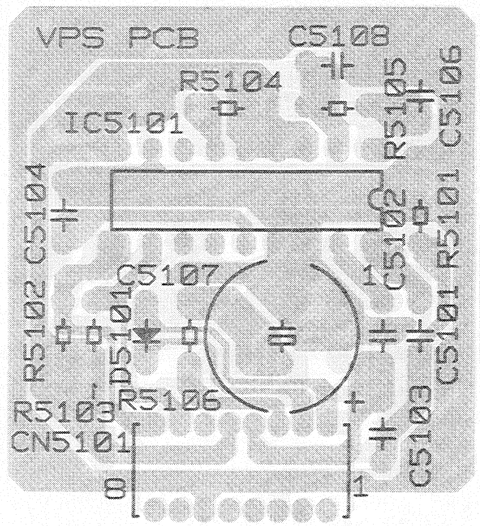


BK8020F01A01A

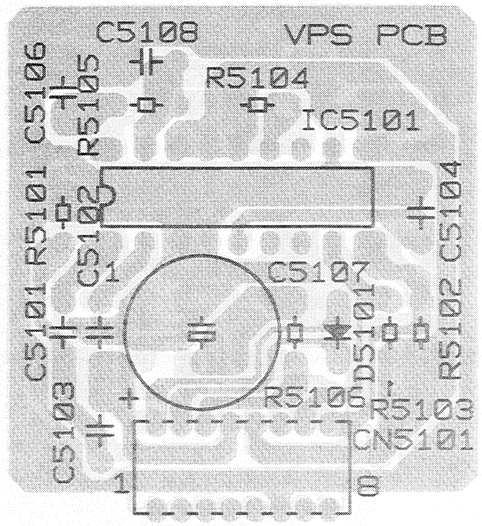
MODEL NO. 4A-025 /4A-035

VPS C.B.A.

TOP VIEW

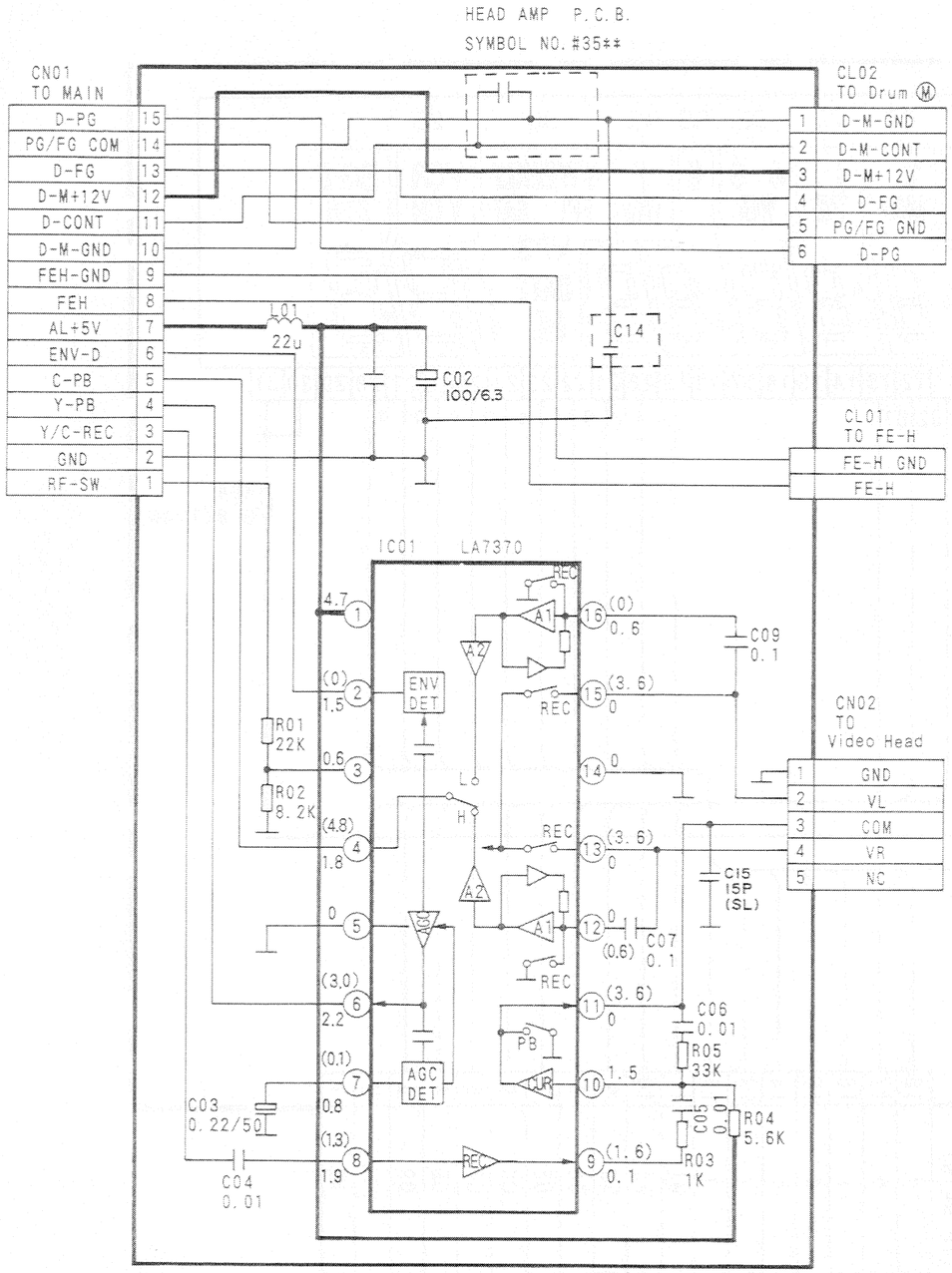


BOTTOM VIEW



BK8630F01001

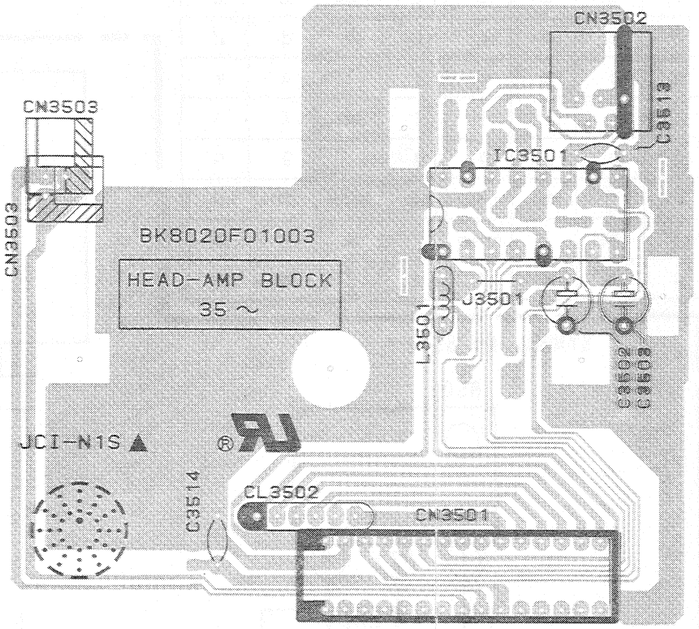
HEAD AMP SCHEMATIC DIAGRAM



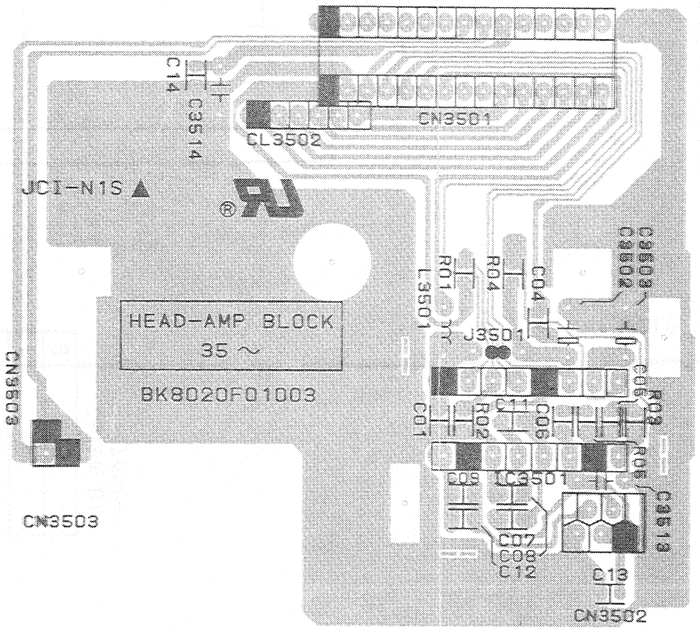
NORMARK:PLAY Mode
( ):REC Mode

HEAD AMP C.B.A.

TOP VIEW



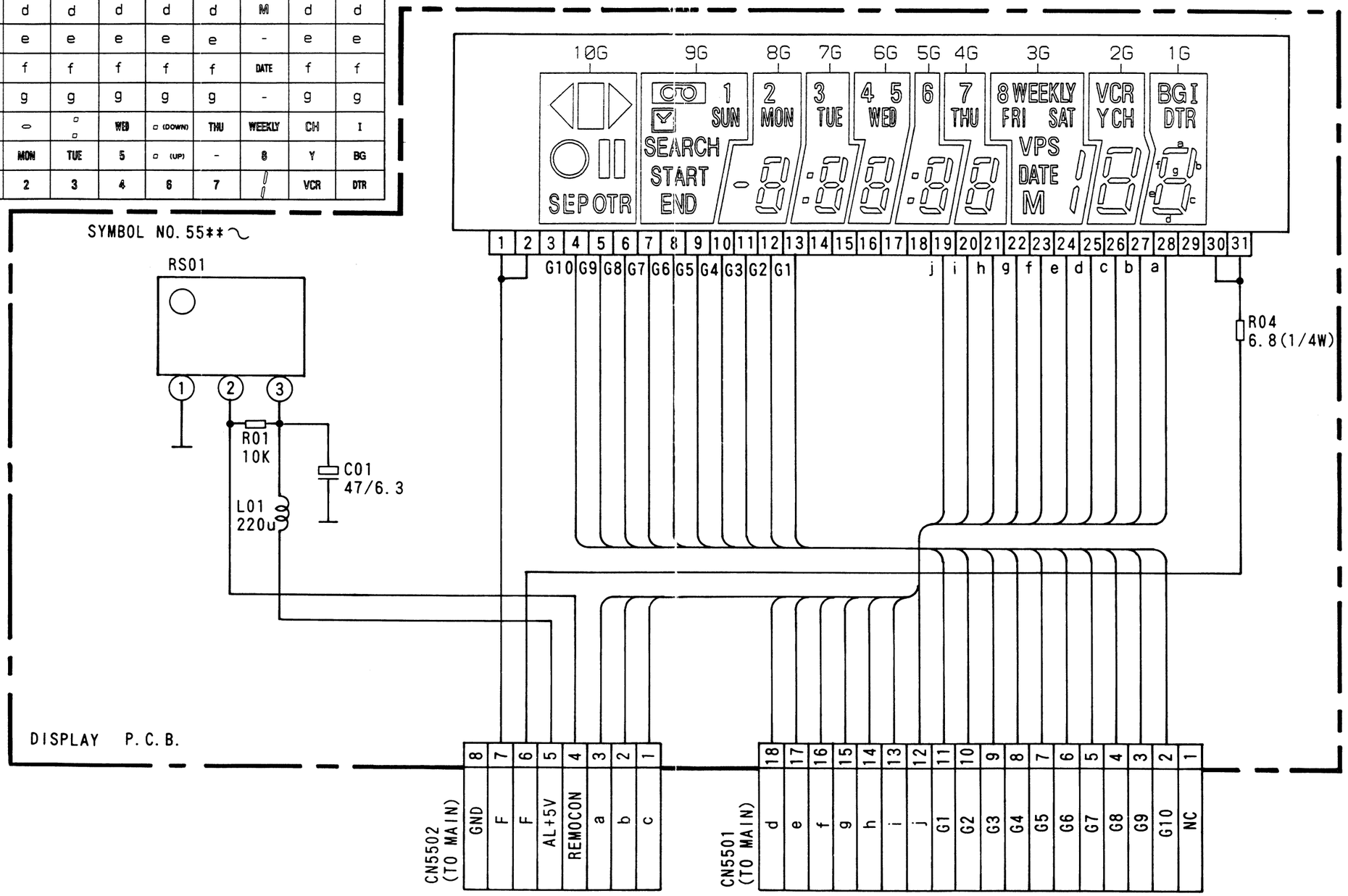
BOTTOM VIEW



DISPLAY / CONTROL SCHEMATIC DIAGRAMS

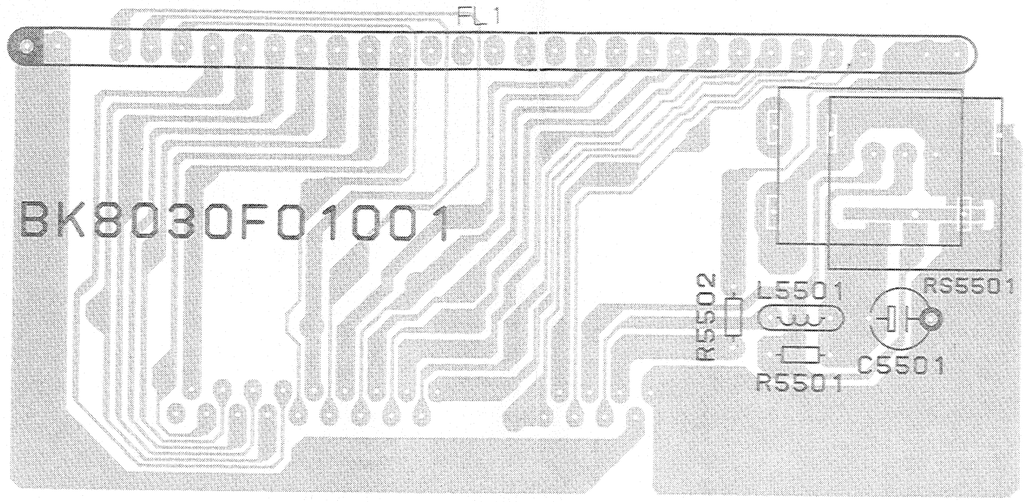
ANODE CONNECTION

10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
○	☑	a	a	a	a	a	FRI	a	a
⏸	SUN	b	b	b	b	b	SAT	b	b
OTR	-	c	c	c	c	c	VPS	c	c
L	-	d	d	d	d	d	M	d	d
P	START	e	e	e	e	e	-	e	e
S	SEARCH	f	f	f	f	f	DATE	f	f
≡	-	g	g	g	g	g	-	g	g
▷	END	⬭	▫ ▫	WED	▫ (DOWN)	THU	WEEKLY	CH	I
□	1	MON	TUE	5	▫ (UP)	-	8	Y	BG
◁	📼	2	3	4	6	7	/	VCR	DTR

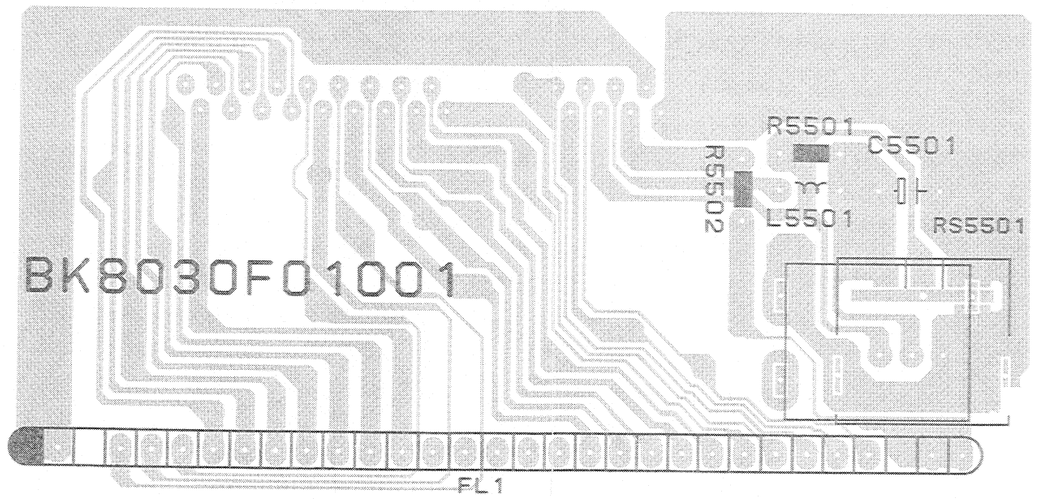


DISPLAY / CONTROL C.B.A.

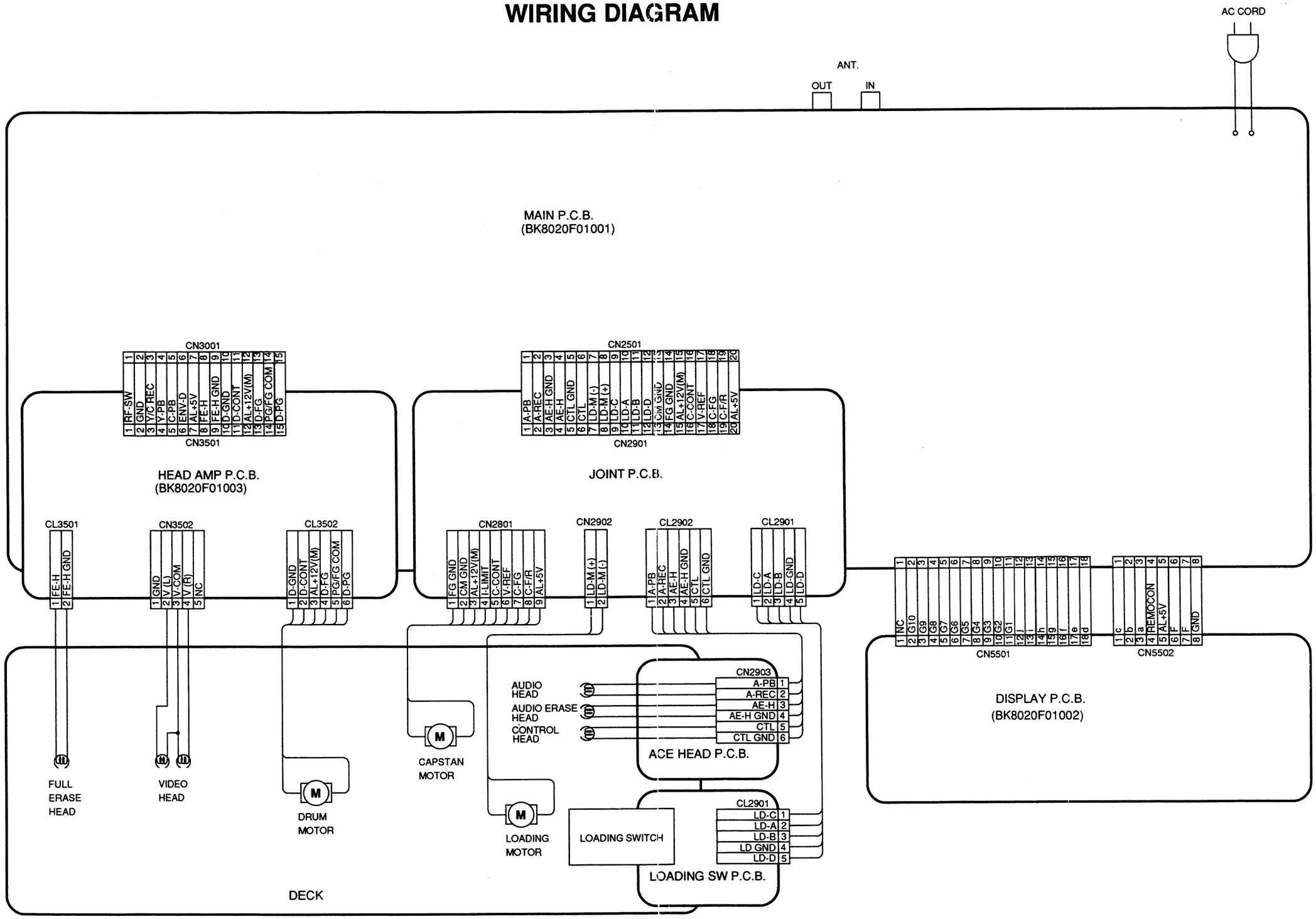
TOP VIEW



BOTTOM VIEW



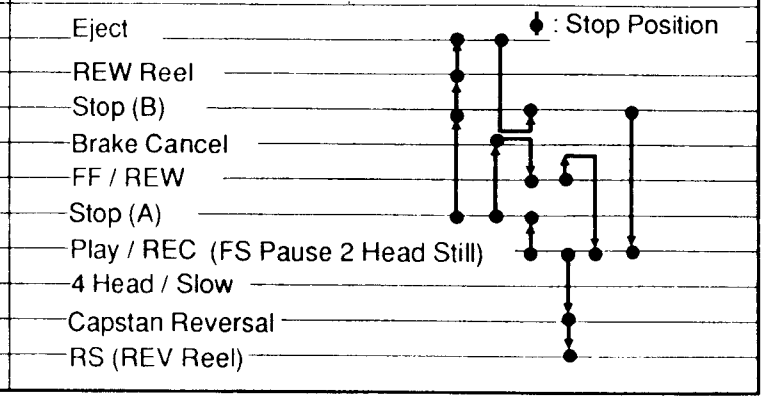
WIRING DIAGRAM



SYSTEM CONTROL TIMING CHARTS

LOADING SW : LD-A / LD-B / LD-C / LD-D

LD-SW				Symbol	Stop Position (Stop Pattern)
LD-A	LD-B	LD-C	LD-D		
L	H	H	H	EJ	
H	H	H	H	CL	
L	L	H	H	SB	
H	L	H	H	TL	
H	L	L	H	FB	
H	H	L	H	SF	
H	H	L	L	AU	
H	H	H	L	AL	
H	L	H	L	SS	
H	H	H	H	GC	
L	H	H	L	RS	



Note :

EJ ⟶ RS : Loading FWD (LM-FWD "H", LM-REV "L")
RS ⟶ EJ : Loading REV (LM-FWD "L", LM-REV "H")
Stop (A) = LOADING
Stop (B) = UNLOADING

Note :

Symbol	Loading Status
EJ	EJECT
CL	EJECT ~ LOADING Completion
SB	REW ~ STOP(B)
TL	STOP(B) ~ BRAKE Cancel
FB	BRAKE Cancel ~ FF / REW
SF	FF / REW ~ STOP(A)
AU	STOP(A) ~ PLAY / REC
AL	PLAY / REC ~ 4 HEAD STILL / SLOW
SS	4 HEAD STILL / SLOW ~ CAPSTAN Reversal
GC	CAPSTAN Reversal ~ REW Reel
RS	REW

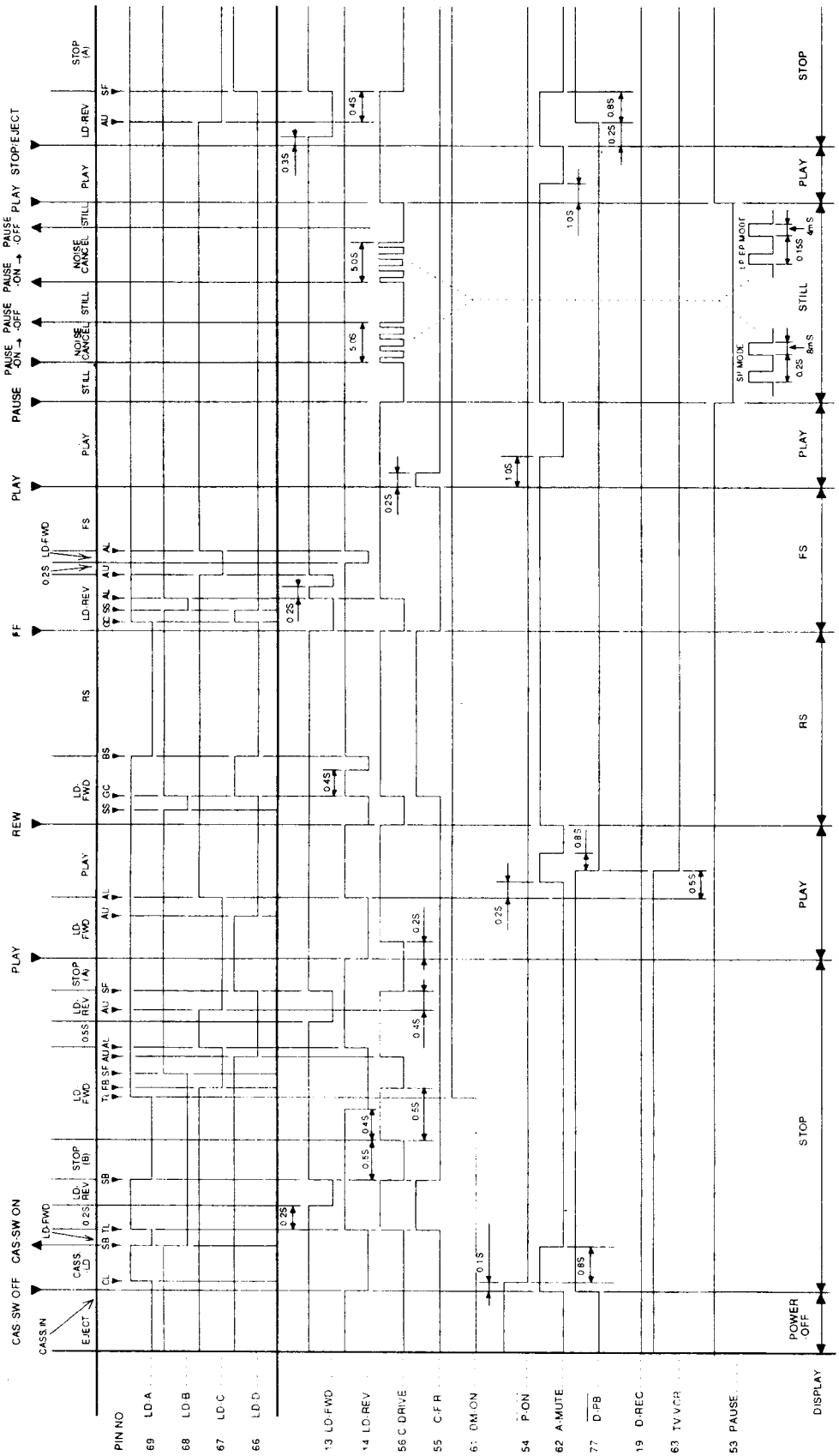
LOADING MOTOR / CONTROL

LM-FWD	LM-REV	MOTOR	Description
H	H	STOP	STOP
H	L	PLAY	LOADING FWD
L	H	REVERSAL	LOADING REV

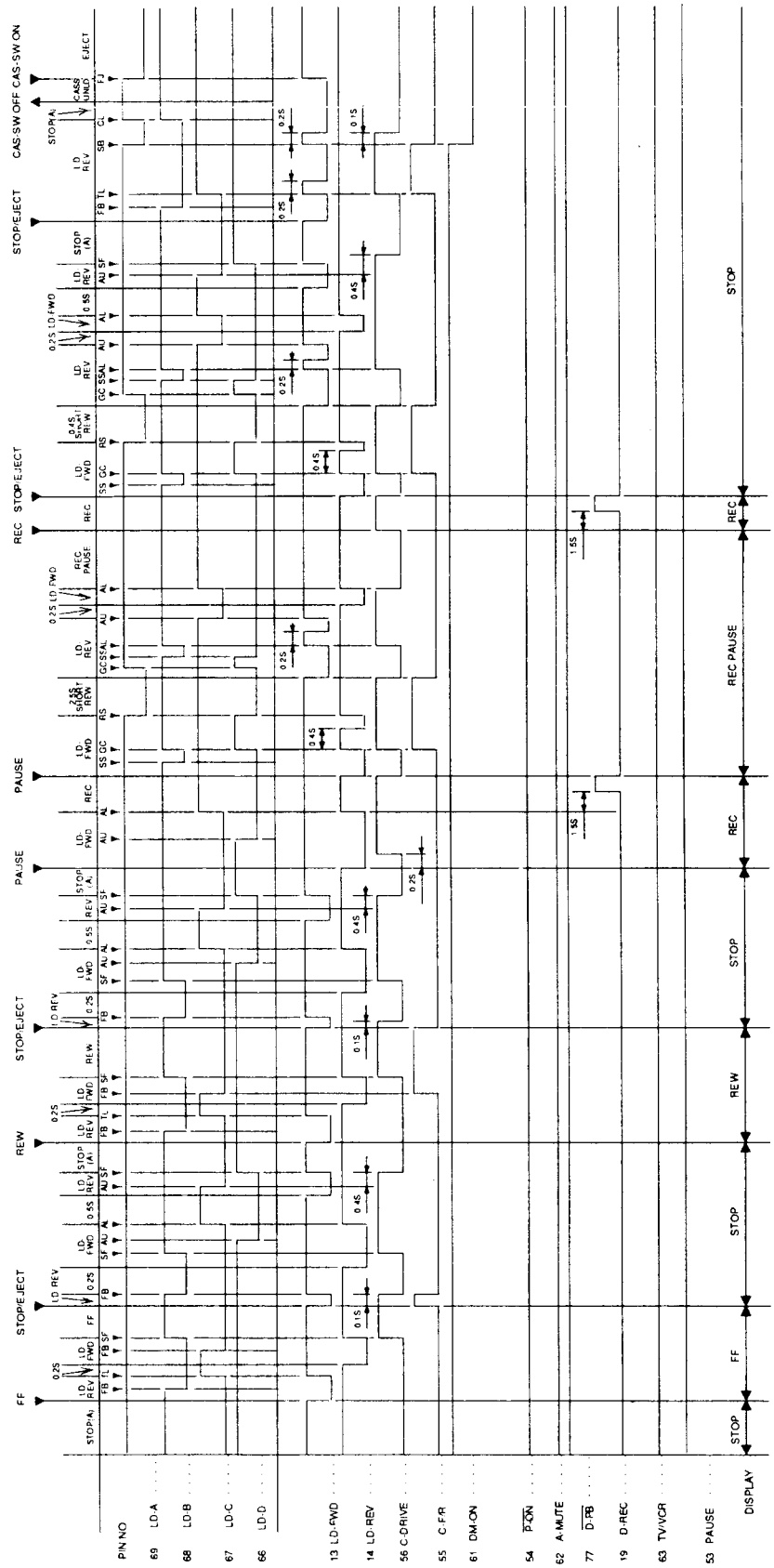
CAPSTAN MOTOR / CONTROL

C-DRIVE	C-F/R	MOTOR	Description
L	L/H	STOP	STOP, The BRAKE Is Not Applied.
H	L	PLAY	CAPSTAN, Reel PLAY, Cassete Out Direction
H	H	REVERSAL	CAPSTAN, Reel Revers Rotation, Cassete In Direction

EJECT (POWER-OFF) → CASSETTE IN (POWER-ON) → STOP (B) → STOP (A) → PLAY → RS → FS → PLAY → PAUSE → PLAY → STOP (A)



STOP (A) → FF → STOP (A) → REW → STOP (A) → REC → PAUSE → PAUSE or REC → STOP (A) → EJECT



ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice of this service manual. Don't degrade the safety of the product through improper servicing.

*Tolerance of Capacitors and Resistors are noted with the following symbols.

C.....±0.25%	J.....±5%	Z.....+80/-20%
D.....±0.5%	K.....±10%	X.....+40/-20%
F.....±1%	M.....±20%	P.....+100%
G.....±2%	N.....±30%	

MCV P.C.BOARD ASSEMBLY....0VSA04844
VPT P.C.BOARD ASSEMBLY....
TMV P.C.BOARD ASSEMBLY....0VSA05024
PRV P.C.BOARD ASSEMBLY....0VSA05026

MCV PCB ASSEMBLY

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
	ASSEMBLY MCV PCB CONSISTS OF THE FOLLOWING:	NOT SUPPLY	←	←	←
	CAPACITORS				
C 1001 ⚠	METALLIZED FILM CAP. 0.1μF/250V M	CA2E104MS005	←	←	←
C 1003 ⚠	CERAMIC CAP. SAFETY 3300pF or	1220884	←	←	←
	CERAMIC CAP. SAFETY 3300pF	CA2H332MS001	←	←	←
C 1004 ⚠	CERAMIC CAP. SAFETY 4700pF or	1220885	←	←	←
	CERAMIC CAP. SAFETY 4700pF	CA2H472MS001	←	←	←
C 1005 ⚠	CERAMIC CAP. SAFETY 4700pF or	1220885	←	←	←
	CERAMIC CAP. SAFETY 4700pF	CA2H472MS001	←	←	←
C 1006	ELECTROLYTIC CAP. 47μF/400V M or	122Z651	←	←	←
	ELECTROLYTIC CAP. 47μF/400V M or	CA2H470EA004	←	←	←
	ELECTROLYTIC CAP. 47μF/400V M	CA2H470MS002	←	←	←
C 1007	CERAMIC CAP. 0.01μF/500V or	CA2J103TU001	←	←	←
	CERAMIC CAP. 0.01μF/500V	CCD2JKP0B103	←	←	←
C 1008	CERAMIC CAP. SL J 120pF/1KV or	CA3A121MR506	←	←	←
	CERAMIC CAP. SL K 120pF/1KV	CCD3AKPSL121	←	←	←
C 1009	CHIP CERAMIC CAP. F Z 0.0033μF/50V	CHE1JZB0F332	←	←	←
C 1010	CHIP CERAMIC CAP. F Z 0.0047μF/50V	CHE1JZB0F472	←	←	←
C 1011	SEMICONDUCTOR CAP. SR K 0.027μF/25V	12Y2273	←	←	←
C 1012	CERAMIC CAP. X K 0.0047μF/16V	3X4C472T	←	←	←
C 1013	ELECTROLYTIC CAP. 1μF/50V M	126F105S	←	←	←
C 1014	ELECTROLYTIC CAP. 0.1μF/50V M	126F104S	←	←	←
C 1016	ELECTROLYTIC CAP. 4.7μF/50V M	126F475S	←	←	←
C 1017	ELECTROLYTIC CAP. 330μF/50V M or	CE1JMZPDH331	←	←	←
	ELECTROLYTIC CAP. 330μF/50V or	CA1J331SP007	←	←	←
	ELECTROLYTIC CAP. 330μF/50V M	121H337	←	←	←
C 1018	ELECTROLYTIC CAP. 330μF/16V M	126C337S	←	←	←
C 1019	ELECTROLYTIC CAP. 22μF/35V M	126E226S	←	←	←
C 1020	ELECTROLYTIC CAP. 330μF/16V or	CE1CMASDH331	←	←	←
	ELECTROLYTIC CAP. 330μF/16V M or	121D337S	←	←	←
	ELECTROLYTIC CAP. 330μF/16V	CA1C331SP008	←	←	←
C 1021	ELECTROLYTIC CAP. 1000μF/6.3V M	126A108S	←	←	←
C 1022	ELECTROLYTIC CAP. 100μF/6.3V or	CE0KMASDH101	←	←	←
	ELECTROLYTIC CAP. 100μF/6.3V or	CA0K101NC006	←	←	←
	ELECTROLYTIC CAP. 100μF/6.3V	CA0K101SP008	←	←	←
C 1023	CHIP CERAMIC CAP. F Z 0.01μF/50V	CHE1JZB0F103	←	←	←
C 1026 ⚠	CERAMIC CAP. SAFETY 3300pF or	1220884	←	←	←
	CERAMIC CAP. SAFETY 3300pF	CA2H332MS001	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
C 1027 ⚠	CERAMIC CAP. SAFETY 1000pF or	1220278	←	←	←
	CERAMIC CAP. SAFETY 1000pF	CA2H102MS001	←	←	←
C 1501	ELECTROLYTIC CAP. 0.47µF/50V M	126F474S	←	←	←
C 1505	ELECTROLYTIC CAP. 4.7µF/25V M	126D475S	←	←	←
C 1506	ELECTROLYTIC CAP. 4.7µF/25V M	126D475S	←	←	←
C 2001	POLYESTER FILM CAP. 0.033µF/50V J	2254333S	←	←	←
C 2002	CHIP CERAMIC CAP. F Z 0.01µF/50V	CHE1JZB0F103	←	←	←
C 2003	CHIP CERAMIC CAP. B K 0.01µF/25V	CHE1EKB0B103	←	←	←
C 2004	CHIP CERAMIC CAP. B K 0.01µF/25V	CHE1EKB0B103	←	←	←
C 2005	CHIP CERAMIC CAP. B K 0.01µF/25V	CHE1EKB0B103	←	←	←
C 2006	ELECTROLYTIC CAP. 100µF/6.3V M H7	526R107S	←	←	←
C 2007	ELECTROLYTIC CAP. 0.22µF/50V M H7	526W224S	←	←	←
C 2009	ELECTROLYTIC CAP. 100µF/6.3V M H7	526R107S	←	←	←
C 2010	SEMICONDUCTOR CAP. SR K 0.15µF/16V	12Y6154S	←	←	←
C 2011	ELECTROLYTIC CAP. 10µF/16V M H7	526T106S	←	←	←
C 2012	ELECTROLYTIC CAP. 10µF/16V M H7	526T106S	←	←	←
C 2013	ELECTROLYTIC CAP. 1µF/50V M H7	526W105S	←	←	←
C 2015	ELECTROLYTIC CAP. 10µF/16V M H7	526T106S	←	←	←
C 2016	CHIP CERAMIC CAP. F Z 0.01µF/50V	CHE1JZB0F103	←	←	←
C 2017	ELECTROLYTIC CAP. 10µF/16V M LL	124H106S	←	←	←
C 2018	CHIP CERAMIC CAP. B K 0.027µF/16V	CHE1CKB0B273	←	←	←
C 2019	CHIP CERAMIC CAP. B K 0.01µF/25V	CHE1EKB0B103	←	←	←
C 2020	ELECTROLYTIC CAP. 47µF/6.3V M H7	526R476S	←	←	←
C 2021	ELECTROLYTIC CAP. 10µF/16V M H7	526T106S	←	←	←
C 2022	ELECTROLYTIC CAP. 1µF/50V M H7	526W105S	←	←	←
C 2023	CHIP CERAMIC CAP. B K 0.001µF/50V	CHE1JKB0B102	←	←	←
C 2024	CHIP CERAMIC CAP. F Z 0.01µF/50V	CHE1JZB0F103	←	←	←
C 2025	CHIP CERAMIC CAP. B K 0.022µF/16V	CHE1CKB0B223	←	←	←
C 2028	ELECTROLYTIC CAP. 10µF/16V M H7	526T106S	←	←	←
C 2029	ELECTROLYTIC CAP. 1µF/50V M H7	526W105S	←	←	←
C 3001	CHIP CERAMIC CAP. SL J 18pF/50V	CHE1JJBSL180	←	←	←
C 3002	CHIP CERAMIC CAP. SL J 18pF/50V	CHE1JJBSL180	←	←	←
C 3003	CHIP CERAMIC CAP. SL J 56pF/50V	CHE1JJBSL560	←	←	←
C 3005	CHIP CERAMIC CAP. SL J 22pF/50V	CHE1JJBSL220	←	←	←
C 3006	CHIP CERAMIC CAP. F Z 0.022µF/50V	CHE1JZB0F223	←	←	←
C 3007	CHIP CERAMIC CAP. F Z 0.01µF/50V	CHE1JZB0F103	←	←	←
C 3010	CHIP CERAMIC CAP. B K 470pF/50V	CHE1JKB0B471	←	←	←
C 3011	CHIP CERAMIC CAP. SL J 120pF/50V	CHE1JJBSL121	←	←	←
C 3012	CHIP CERAMIC CAP. B K 270pF/50V	CHE1JKB0B271	←	←	←
C 3013	CHIP CERAMIC CAP. B K 0.022µF/16V	CHE1CKB0B223	←	←	←
C 3014	CHIP CERAMIC CAP. SL J 68pF/50V	CHE1JJBSL680	←	←	←
C 3015	CHIP CERAMIC CAP. SL J 150pF/50V	CHE1JJBSL151	←	←	←
C 3016	CHIP CERAMIC CAP. SL J 33pF/50V	CHE1JJBSL330	←	←	←
C 3017	CHIP CERAMIC CAP. B K 0.047µF/16V	CHE1CKB0B473	←	←	←
C 3018	CHIP CERAMIC CAP. SL D 10pF/50V	CHE1JDBSL100	←	←	←
C 3019	CHIP CERAMIC CAP. B K 0.022µF/16V	CHE1CKB0B223	←	←	←
C 3020	CHIP CERAMIC CAP. SL J 47pF/50V	CHE1JJBSL470	←	←	←
C 3021	ELECTROLYTIC CAP. 47µF/16V M H7	526T476S	←	←	←
C 3022	ELECTROLYTIC CAP. 470µF/6.3V M	126A477S	←	←	←
C 3023	ELECTROLYTIC CAP. 1µF/50V M H7	526W105S	←	←	←
C 3024	CHIP CERAMIC CAP. B K 390pF/50V	CHE1JKB0B391	←	←	←
C 3025	CHIP CERAMIC CAP. SL J 180pF/50V	CHE1JJBSL181	←	←	←
C 3026	CHIP CERAMIC CAP. SL D 10pF/50V	CHE1JDBSL100	←	←	←
C 3027	CHIP CERAMIC CAP. SL J 22pF/50V	CHE1JJBSL220	←	←	←
C 3028	CHIP CERAMIC CAP. SL J 47pF/50V	CHE1JJBSL470	←	←	←
C 3029	CHIP CERAMIC CAP. SL J 56pF/50V	CHE1JJBSL560	←	←	←
C 3030	CHIP CERAMIC CAP. SL D 10pF/50V	CHE1JDBSL100	←	←	←
C 3031	CHIP CERAMIC CAP. SL J 100pF/50V	CHE1JJBSL101	←	←	←
C 3032	ELECTROLYTIC CAP. 10µF/16V M H7	526T106S	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
C 3033	ELECTROLYTIC CAP. 10μF/16V M H7	526T106S	←	←	←
C 3034	ELECTROLYTIC CAP. 1μF/50V M H7	526W105S	←	←	←
C 3035	CHIP CERAMIC CAP. SL J 82pF/50V	CHE1JJBSL820	←	←	←
C 3036	CHIP CERAMIC CAP. SL D 6pF/50V	CHE1JDBSL6R0	←	←	←
C 3037	CHIP CERAMIC CAP. SL J 39pF/50V	CHE1JJBSL390	←	←	←
C 3038	ELECTROLYTIC CAP. 10μF/16V M H7	526T106S	←	←	←
C 3039	CHIP CERAMIC CAP. F Z 0.022μF/50V	CHE1JZB0F223	←	←	←
C 3040	ELECTROLYTIC CAP. 1μF/50V M H7	526W105S	←	←	←
C 3041	ELECTROLYTIC CAP. 4.7μF/50V M H7	526W475S	←	←	←
C 3042	CHIP CERAMIC CAP. B K 0.01μF/25V	CHE1EKB0B103	←	←	←
C 3043	CHIP CERAMIC CAP. B K 0.01μF/25V	CHE1EKB0B103	←	←	←
C 3044	CHIP CERAMIC CAP. SL J 22pF/50V	CHE1JJBSL220	←	←	←
C 3045	CHIP CERAMIC CAP. B K 220pF/50V	CHE1JKB0B221	←	←	←
C 3046	CHIP CERAMIC CAP. F Z 0.01μF/50V	CHE1JZB0F103	←	←	←
C 3047	CHIP CERAMIC CAP. F Z 0.022μF/50V	CHE1JZB0F223	←	←	←
C 3048	CHIP CERAMIC CAP. B K 0.01μF/25V	CHE1EKB0B103	←	←	←
C 3049	CHIP CERAMIC CAP. B K 0.047μF/16V	CHE1CKB0B473	←	←	←
C 3050	CHIP CERAMIC CAP. B K 0.047μF/16V	CHE1CKB0B473	←	←	←
C 3051	ELECTROLYTIC CAP. 1μF/50V M H7	526W105S	←	←	←
C 3052	ELECTROLYTIC CAP. 1μF/50V M H7	526W105S	←	←	←
C 3053	CHIP CERAMIC CAP. B K 0.01μF/25V	CHE1EKB0B103	←	←	←
C 3057	CHIP CERAMIC CAP. F Z 0.047μF/25V	CHE1EZB0F473	←	←	←
C 3061	CHIP CERAMIC CAP. F Z 0.01μF/50V	CHE1JZB0F103	←	←	←
C 3062	ELECTROLYTIC CAP. 4.7μF/50V M H7	526W475S	←	←	←
C 3063	ELECTROLYTIC CAP. 1μF/50V M H7	526W105S	←	←	←
C 3064	CHIP CERAMIC CAP. B K 0.022μF/16V	CHE1CKB0B223	←	←	←
C 3065	ELECTROLYTIC CAP. 0.1μF/50V M H7	526W104S	←	←	←
C 3066	ELECTROLYTIC CAP. 10μF/16V M H7	526T106S	←	←	←
C 3067	CHIP CERAMIC CAP. F Z 0.1μF/16V	CHE1CZB0F104	←	←	←
C 3068	ELECTROLYTIC CAP. 220μF/6.3V M H7	526R227S	←	←	←
C 3069	CHIP CERAMIC CAP. F Z 0.1μF/16V	CHE1CZB0F104	←	←	←
C 3070	ELECTROLYTIC CAP. 4.7μF/50V M H7	526W475S	←	←	←
C 3071	CHIP CERAMIC CAP. F Z 0.01μF/50V	CHE1JZB0F103	←	←	←
C 3072	ELECTROLYTIC CAP. 10μF/16V M H7	526T106S	←	←	←
C 3073	ELECTROLYTIC CAP. 47μF/6.3V M H7	526R476S	←	←	←
C 3074	CHIP CERAMIC CAP. F Z 0.022μF/50V	CHE1JZB0F223	←	←	←
C 3510	CERAMIC CAP. F Z 0.047μF/50V	3F10473	←	←	←
C 4001	CHIP CERAMIC CAP. B K 0.0018μF/50V	CHE1JKB0B182	←	←	←
C 4002	CHIP CERAMIC CAP. B K 0.0015μF/50V	CHE1JKB0B152	←	←	←
C 4004	ELECTROLYTIC CAP. 10μF/16V M H7	526T106S	←	←	←
C 4005	CHIP CERAMIC CAP. B K 0.01μF/25V	CHE1EKB0B103	←	←	←
C 4006	CHIP CERAMIC CAP. F Z 0.1μF/16V	CHE1CZB0F104	←	←	←
C 4008	ELECTROLYTIC CAP. 22μF/16V M H7	526T226S	←	←	←
C 4010	CHIP CERAMIC CAP. F Z 0.1μF/16V	CHE1CZB0F104	←	←	←
C 4011	ELECTROLYTIC CAP. 10μF/16V M H7	526T106S	←	←	←
C 4012	CHIP CERAMIC CAP. B K 0.01μF/25V	CHE1EKB0B103	←	←	←
C 4013	CHIP CERAMIC CAP. B K 0.01μF/25V	CHE1EKB0B103	←	←	←
C 4014	ELECTROLYTIC CAP. 4.7μF/25V M H7	526U475S	←	←	←
C 4015	ELECTROLYTIC CAP. 22μF/16V M H7	526T226S	←	←	←
C 4016	CHIP CERAMIC CAP. SL J 220pF/50V	CHE1JJBSL221	←	←	←
C 4017	MYLAR CAP. 0.047μF/100V J	6255473S	←	←	←
C 4019	CHIP CERAMIC CAP. B K 0.01μF/25V	CHE1EKB0B103	←	←	←
C 4020	CHIP CERAMIC CAP. B K 0.01μF/25V	CHE1EKB0B103	←	←	←
C 4021	ELECTROLYTIC CAP. 22μF/16V M H7	526T226S	←	←	←
C 6001	CHIP CERAMIC CAP. F Z 0.001μF/50V	CHE1JZB0F102	←	←	←
C 6002	CHIP CERAMIC CAP. F Z 0.001μF/50V	CHE1JZB0F102	←	←	←
C 6003	ELECTROLYTIC CAP. 220μF/6.3V M H7	526R227S	←	←	←
C 6004	ELECTROLYTIC CAP. 10μF/16V M H7	526T106S	←	←	←
C 6005	CHIP CERAMIC CAP. F Z 0.1μF/16V	CHE1CZB0F104	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
C 6006	CHIP CERAMIC CAP. F Z 0.01μF/50V	CHE1JZB0F103	←	←	←
C 6007	CHIP CERAMIC CAP. CH J 22pF/50V	CHE1JJBCH220	←	←	←
C 6008	CHIP CERAMIC CAP. CH J 27pF/50V	CHE1JJBCH270	←	←	←
C 6009	CHIP CERAMIC CAP. F Z 0.01μF/50V	CHE1JZB0F103	←	←	←
C 7001	ELECTROLYTIC CAP. 10μF/16V M	126C106S	←	←	←
C 7002	ELECTROLYTIC CAP. 100μF/16V M	126C107	←	←	←
C 7003	ELECTROLYTIC CAP. 10μF/16V M	126C106S	←	←	←
C 7004	CHIP CERAMIC CAP. B K 0.001μF/50V	CHE1JKB0B102	←	←	←
C 7005	CHIP CERAMIC CAP. B K 330pF/50V	CHE1JKB0B331	←	←	←
C 7006	ELECTROLYTIC CAP. 0.47μF/50V M	126F474S	←	←	←
C 7007	ELECTROLYTIC CAP. 1μF/50V M	126F105S	←	←	←
C 7008	CHIP CERAMIC CAP. B K 270pF/50V	CHE1JKB0B271	←	←	←
C 7009	ELECTROLYTIC CAP. 0.47μF/50V M	126F474S	←	←	←
C 7010	ELECTROLYTIC CAP. 10μF/16V M	126C106S	←	←	←
C 7011	CHIP CERAMIC CAP. SL J 100pF/50V	CHE1JJBSL101	←	←	←
C 7012	ELECTROLYTIC CAP. 47μF/35V M	126E476S	←	←	←
C 7013	MYLAR CAP. 0.15μF/50V J	2254154S	←	←	←
C 7014	MYLAR CAP. 0.15μF/50V J	2254154S	←	←	←
C 7015	MYLAR CAP. 0.22μF/50V J	2254224S	←	←	←
C 7016	CHIP CERAMIC CAP. B K 0.0068μF/50V	CHE1JKB0B682	←	←	←
C 7017	ELECTROLYTIC CAP. 470μF/6.3V M	126A477S	←	←	←
C 7026	CERAMIC CAP. SL J 39pF/50V	3S11390	←	←	←
C 7027	CERAMIC CAP. SL J 39pF/50V	3S11390	←	←	←
C 7028	CERAMIC CAP. B J 0.001μF/50V	3B11102	←	←	←
C 7501	CHIP CERAMIC CAP. F Z 0.01μF/50V	CHE1JZB0F103	←	←	←
C 7502	ELECTROLYTIC CAP. 100μF/6.3V M H7	526R107S	←	←	←
C 7504	CHIP CERAMIC CAP. B K 0.0039μF/50V	CHE1JKB0B392	←	←	←
C 7505	CHIP CERAMIC CAP. SL J 47pF/50V	CHE1JJBSL470	←	←	←
	CONNECTORS				
CN3001	STRAIGHT PIN CONNECTOR 15P	1770635	←	←	←
CN5101	STRAIGHT PIN CONNECTOR 8P	1770628	←	←	←
CN6001	HINGED PIN CONNECTOR 8P or	J3TRJ08TG003	←	←	←
	STRAIGHT PIN CONNECTOR 20P	1770640	←	←	←
CN6002	HINGED PIN CONNECTOR 18P	J3TRJ18TG003	←	←	←
CN6005	CONNECTOR BASE 4P	J3BFE04NB001	←	←	←
	DIODES				
D 1001 ⚠	DIODE S1WB60	AS1WB60*****	←	←	←
D 1002	DIODE EG01C	QDQZ000EG01C	←	←	←
D 1003	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 1004	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 1005	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 1006	ZENER DIODE MTZ J5.1C	AMTZJ5R1CT77	←	←	←
D 1007	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 1008	SWITCHING DIODE MA188	QDTZ000MA188	←	←	←
D 1009	SCHOTTKY BARRIER DIODE EK14 or	QDQZ0000EK14	←	←	←
	SCHOTTKY BARRIER DIODE ERB83-004	QDQZERB83004	←	←	←
D 1010	SWITCHING DIODE MA188	QDTZ000MA188	←	←	←
D 1011	DIODE AK03 or	QDQZ0000AK03	←	←	←
	DIODE ERA81-004	QDQZERA81004	←	←	←
D 1012	SWITCHING DIODE MA178	QDTZ000MA178	←	←	←
D 1013	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 1014	ZENER DIODE MTZ J5.6C	AMTZJ5R6CT77	←	←	←
D 1501	ZENER DIODE MTZ6.8B	AMTZ6R8BT77*	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
D 1502	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 1503	ZENER DIODE MTZ11B	AMTZ11BT77**	←	←	←
D 1504	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 1505	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 1507	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 1508	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 2001	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 2002	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 2003	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 3001	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 3002	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 3003	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 3004	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 5501	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 5502	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 5503	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 5505	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 5508	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 6001	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 6002	LED SIR-481ST3F	QPPZSIR4813F	←	←	←
D 6013	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 7001	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 7002	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 7503	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
D 7504	DIODE 1SS254 or	A1SS254T77**	←	←	←
	DIODE GMB01B	GMB01BT	←	←	←
	INTERGRATED CIRCUITS				
IC1001	PHOTO COUPLER PC111LY2 or	QPE20PC111LY	←	←	←
	PHOTO COUPLER PC111LYS	QPES0PC111LY	←	←	←
IC1501	VOLTAGE REGULATOR IC AN7812F or	AN7812F	←	←	←
	IC REGULATOR NJM7812FA	14L0251	←	←	←
IC1502	VOLTAGE REGULATOR IC AN78L05 or	AN78L05	←	←	←
	VOLTAGE REGULATOR IC NJM78L05A	J78L05A	←	←	←
IC2001	IC SERVO BU2845S	GC90000RM013	←	←	←
IC2002	IC (OP-AMP.) BA10324	14LF554	←	←	←
IC3001	IC VIDEO LA7390A	QSZLA0SSY001	←	←	←
IC3003	IC LC8992	14LQ489	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
IC4001	IC AUDIO LA7282	QSZLA0SSY003	←	←	←
IC6001	MICROCONTROLLER 8BIT or	QSMQD0RNE008	←	←	←
	MICROCONTROLLER 8BIT	QSMQC0RNE008	←	←	←
IC6002	REEL SENSOR SG-211L	PCZLAZZKK003	←	←	←
IC6003	IC TA7291S	14LW342	←	←	←
IC6004	IC RESET IC-PST529F-2	GR591399****	←	←	←
IC6005	IC X24C01P	GX24C01P0000	←	←	←
IC6006	VOLTAGE REGULATOR IC AN78L05 or	AN78L05	←	←	←
	VOLTAGE REGULATOR IC NJM78L05A	J78L05A	←	←	←
IC7001	IC LA7210 or	14LQ115	←	←	←
	IC MM1021XS	GMM1021XS***	←	←	←
IC7002	IC LA7910	GLA7910*****	←	←	←
IC7003	IC L5631	L5631	←	←	←
IC7501	IC BU4053B or	14DF268	←	←	←
	IC SWITCHING NJU4053BD	14D0436	←	←	←
	COILS				
L 1001	LINE FILTER FK0B160MH16 or	1170567	←	←	←
	LINE FILTER TF2317C-102Y2R0-01	LLBT***TE002	←	←	←
L 1002 ⚠	LINE FILTER 68MH ELF-18D222FN or	LLBG00ZMS006	←	←	←
	LINE FILTER 50MH UF2327S-503Y0R3-01	LLBG00ZTE004	←	←	←
L 1003	LEAD INDUCTOR 22UH K	LLBD00PTU013	←	←	←
L 1004	LEAD INDUCTOR 10UH K	LLBD00PTU011	←	←	←
L 1005	BEAD CORE HF70BB4.1X3X2	XL03003TE001	←	←	←
L 3001	INDUCTOR 22UH-K-26T or	LLAXKDTKA220	←	←	←
	INDUCTOR 22UH-K-26T	LLAXKATTU220	←	←	←
L 3002	INDUCTOR 56UH-K-26T or	LLAXKDTKA560	←	←	←
	INDUCTOR 56UH-K-26T	LLAXKATTU560	←	←	←
L 3003	INDUCTOR 33UH-K-26T or	LLAXKDTKA330	←	←	←
	INDUCTOR 33UH-K-26T	LLAXKATTU330	←	←	←
L 3004	INDUCTOR 22UH-K-26T or	LLAXKDTKA220	←	←	←
	INDUCTOR 22UH-K-26T	LLAXKATTU220	←	←	←
L 3005	INDUCTOR 100UH-K-26T or	LLAXKDTKA101	←	←	←
	INDUCTOR 100UH-K-26T	LLAXKATTU101	←	←	←
L 3006	INDUCTOR 82UH-K-26T or	LLAXKDTKA820	←	←	←
	INDUCTOR 82UH-K-26T	LLAXKATTU820	←	←	←
L 3007	INDUCTOR 180UH-K-26T or	LLAXKDTKA181	←	←	←
	INDUCTOR 180UH-K-26T	LLAXKATTU181	←	←	←
L 3008	INDUCTOR 330UH-K-26T	LLAXKDTKA331	←	←	←
L 3009	INDUCTOR 330UH-K-26T	LLAXKDTKA331	←	←	←
L 3010	INDUCTOR 330UH-K-26T	LLAXKDTKA331	←	←	←
L 3011	INDUCTOR 56UH-K-26T or	LLAXKDTKA560	←	←	←
	INDUCTOR 56UH-K-26T	LLAXKATTU560	←	←	←
L 3012	INDUCTOR 56UH-K-26T or	LLAXKDTKA560	←	←	←
	INDUCTOR 56UH-K-26T	LLAXKATTU560	←	←	←
L 3013	INDUCTOR 68UH-K-26T or	LLAXKDTKA680	←	←	←
	INDUCTOR 68UH-K-26T	LLAXKATTU680	←	←	←
L 3014	INDUCTOR 27UH-K-26T or	LLAXKDTKA270	←	←	←
	INDUCTOR 27UH-K-26T	LLAXKATTU270	←	←	←
L 3015	INDUCTOR 39UH-K-26T or	LLAXKDTKA390	←	←	←
	INDUCTOR 39UH-K-26T	LLAXKATTU390	←	←	←
L 3016	INDUCTOR 47UH-K-26T or	LLAXKDTKA470	←	←	←
	INDUCTOR 47UH-K-26T	LLAXKATTU470	←	←	←
L 3017	INDUCTOR 100UH-K-26T or	LLAXKDTKA101	←	←	←
	INDUCTOR 100UH-K-26T	LLAXKATTU101	←	←	←
L 3018	INDUCTOR 10UH-K-26T or	LLAXKDTKA100	←	←	←
	INDUCTOR 10UH-K-26T	LLAXKATTU100	←	←	←
L 3019	INDUCTOR 15UH-K-26T or	LLAXKDTKA150	←	←	←
	INDUCTOR 15UH-K-26T	LLAXKATTU150	←	←	←
L 3020	LEAD INDUCTOR 22UH K	LLBD00PTU013	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
L 4001	INDUCTOR 18MH or	117M547	←	←	←
	INDUCTOR 18MH or	117D657	←	←	←
	INDUCTOR 18MH	1170524	←	←	←
	TRANSISTORS				
Q 1001	TRANSISTOR 2SC4204	QQSZ02SC4204	←	←	←
Q 1002 ⚠	TRANSISTOR 2SC4517 or	QQPZ02SC4517	←	←	←
	TRANSISTOR 2SC3866 or	QQPZ02SC3866	←	←	←
	TRANSISTOR 2SC3979	QQPZ02SC3979	←	←	←
Q 1003	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
Q 1004	TRANSISTOR 2SA933(Q) or	A933QZ	←	←	←
	TRANSISTOR 2SA933(R) or	A933RZ	←	←	←
	TRANSISTOR 2SA608SP(E) or	A608SEZ	←	←	←
	TRANSISTOR 2SA608SP(F)	A608SFZ	←	←	←
Q 1005	TRANSISTOR 2SA933(Q) or	A933QZ	←	←	←
	TRANSISTOR 2SA933(R) or	A933RZ	←	←	←
	TRANSISTOR 2SA608SP(E) or	A608SEZ	←	←	←
	TRANSISTOR 2SA608SP(F)	A608SFZ	←	←	←
Q 1501	TRANSISTOR 2SD1581(L) or	QQPL02SD1581	←	←	←
	TRANSISTOR 2SD1581(K)	QQPK02SD1581	←	←	←
Q 1502	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
Q 1504	RES. BUILT-IN TRANSISTOR DTA143XS	A143XSZ	←	←	←
Q 1506	TRANSISTOR 2SA933(Q) or	A933QZ	←	←	←
	TRANSISTOR 2SA933(R) or	A933RZ	←	←	←
	TRANSISTOR 2SA608SP(E) or	A608SEZ	←	←	←
	TRANSISTOR 2SA608SP(F)	A608SFZ	←	←	←
Q 1507	RES. BUILT-IN TRANSISTOR DTC124ES or	C124ESZ	←	←	←
	RES. BUILT-IN TRANSISTOR 2SC3400	C3400Z	←	←	←
Q 1508	TRANSISTOR 2SA933(Q) or	A933QZ	←	←	←
	TRANSISTOR 2SA933(R) or	A933RZ	←	←	←
	TRANSISTOR 2SA608SP(E) or	A608SEZ	←	←	←
	TRANSISTOR 2SA608SP(F)	A608SFZ	←	←	←
Q 1509	RES. BUILT-IN TRANSISTOR DTC124ES or	C124ESZ	←	←	←
	RES. BUILT-IN TRANSISTOR 2SC3400	C3400Z	←	←	←
Q 1510	RES. BUILT-IN TRANSISTOR DTA143XS	A143XSZ	←	←	←
Q 1511	RES. BUILT-IN TRANSISTOR DTC124ES or	C124ESZ	←	←	←
	RES. BUILT-IN TRANSISTOR 2SC3400	C3400Z	←	←	←
Q 2002	RES. BUILT-IN TRANSISTOR DTA124ES or	A124ESZ	←	←	←
	RES. BUILT-IN TRANSISTOR 2SA1346	A1346Z	←	←	←
Q 2003	RES. BUILT-IN TRANSISTOR DTA124ES or	A124ESZ	←	←	←
	RES. BUILT-IN TRANSISTOR 2SA1346	A1346Z	←	←	←
Q 2004	RES. BUILT-IN TRANSISTOR DTC124ES or	C124ESZ	←	←	←
	RES. BUILT-IN TRANSISTOR 2SC3400	C3400Z	←	←	←
Q 3001	TRANSISTOR 2SC2058(P) or	C2058PZ	←	←	←
	TRANSISTOR 2SC2058(Q) or	C2058QZ	←	←	←
	TRANSISTOR 2SC2839(E) or	C2839EZ	←	←	←
	TRANSISTOR 2SC2839(F)	C2839FZ	←	←	←
Q 3002	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
Q 3003	TRANSISTOR 2SC2058(P) or	C2058PZ	←	←	←
	TRANSISTOR 2SC2058(Q) or	C2058QZ	←	←	←
	TRANSISTOR 2SC2839(E) or	C2839EZ	←	←	←
	TRANSISTOR 2SC2839(F)	C2839FZ	←	←	←
Q 3004	RES. BUILT-IN TRANSISTOR DTA144WS	A144WSZ	←	←	←
Q 3005	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
Q 3006	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
Q 3007	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
Q 3008	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
Q 3009	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
Q 3010	TRANSISTOR 2SA933(Q) or	A933QZ	←	←	←
	TRANSISTOR 2SA933(R) or	A933RZ	←	←	←
	TRANSISTOR 2SA608SP(E) or	A608SEZ	←	←	←
	TRANSISTOR 2SA608SP(F)	A608SFZ	←	←	←
Q 3012	RES. BUILT-IN TRANSISTOR DTC124ES or	C124ESZ	←	←	←
	RES. BUILT-IN TRANSISTOR 2SC3400	C3400Z	←	←	←
Q 3013	TRANSISTOR 2SA933(Q) or	A933QZ	←	←	←
	TRANSISTOR 2SA933(R) or	A933RZ	←	←	←
	TRANSISTOR 2SA608SP(E) or	A608SEZ	←	←	←
	TRANSISTOR 2SA608SP(F)	A608SFZ	←	←	←
Q 3014	TRANSISTOR 2SA933(Q) or	A933QZ	←	←	←
	TRANSISTOR 2SA933(R) or	A933RZ	←	←	←
	TRANSISTOR 2SA608SP(E) or	A608SEZ	←	←	←
	TRANSISTOR 2SA608SP(F)	A608SFZ	←	←	←
Q 3015	RES. BUILT-IN TRANSISTOR DTA144WS	A144WSZ	←	←	←
Q 3016	RES. BUILT-IN TRANSISTOR DTC124ES or	C124ESZ	←	←	←
	RES. BUILT-IN TRANSISTOR 2SC3400	C3400Z	←	←	←
Q 3017	TRANSISTOR 2SA933(Q) or	A933QZ	←	←	←
	TRANSISTOR 2SA933(R) or	A933RZ	←	←	←
	TRANSISTOR 2SA608SP(E) or	A608SEZ	←	←	←
	TRANSISTOR 2SA608SP(F)	A608SFZ	←	←	←
Q 3018	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
Q 3019	TRANSISTOR 2SC2058(P) or	C2058PZ	←	←	←
	TRANSISTOR 2SC2058(Q) or	C2058QZ	←	←	←
	TRANSISTOR 2SC2839(E) or	C2839EZ	←	←	←
	TRANSISTOR 2SC2839(F)	C2839FZ	←	←	←
Q 3020	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
Q 4001	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
Q 6001	PHOTO TRANSISTOR RPT-38PB3F	QRPT38PB0000	←	←	←
Q 6002	PHOTO TRANSISTOR RPT-38PB3F	QRPT38PB0000	←	←	←
Q 6003	TRANSISTOR 2SD400(F)	D400FZ	←	←	←
Q 6004	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
Q 6005	RES. BUILT-IN TRANSISTOR DTA124ES or	A124ESZ	←	←	←
	RES. BUILT-IN TRANSISTOR 2SA1346	A1346Z	←	←	←
Q 7001	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
Q 7002	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
Q 7003	FET 2SK128(P) or	K128PZ	←	←	←
	FET 2SK128(Q) or	K128QZ	←	←	←
	FET 2SK304(C) or	K304CZ	←	←	←
	FET 2SK304(D)	K304DZ	←	←	←
Q 7004	RES. BUILT-IN TRANSISTOR DTA124ES or	A124ESZ	←	←	←
	RES. BUILT-IN TRANSISTOR 2SA1346	A1346Z	←	←	←
Q 7005	TRANSISTOR 2SD1468(R) or	D1468RZ	←	←	←
	TRANSISTOR 2SD1468(S) or	D1468SZ	←	←	←
	TRANSISTOR 2SD1012(F) or	D1012FZ	←	←	←
	TRANSISTOR 2SD1012(G)	D1012GZ	←	←	←
Q 7006	RES. BUILT-IN TRANSISTOR DTC124ES or	C124ESZ	←	←	←
	RES. BUILT-IN TRANSISTOR 2SC3400	C3400Z	←	←	←
Q 7007	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
Q 7008	TRANSISTOR 2SC1740(Q) or	C1740QZ	←	←	←
	TRANSISTOR 2SC1740(R) or	C1740RZ	←	←	←
	TRANSISTOR 2SC536SP(E) or	C536SEZ	←	←	←
	TRANSISTOR 2SC536SP(F)	C536SFZ	←	←	←
	RESISTORS				
J 323	CARBON RES. 1/5W J 1.5KΩ or	1324152	←	←	←
	CARBON RES. 1/6W J 1.5KΩ or	132A152	←	←	←
	CARBON RES. 1/4W J 1.5KΩ	RCX4JZPZ0152	←	←	←
R 1002 ⚠	WIREWOUND RES. 2W 4.7Ω	RW024R7KA001	←	←	←
R 1009	METAL RES. 2W J 82KΩ	1330513	←	←	←
R 1010	CHIP RES. 1/10W J 470Ω	RRXAJBBZ0471	←	←	←
R 1011	CHIP RES. 1/10W J 3.9KΩ	RRXAJBBZ0392	←	←	←
R 1012	CHIP RES. 1/10W J 2.7KΩ	RRXAJBBZ0272	←	←	←
R 1013	METAL RES. 1W J 82Ω	1330412	←	←	←
R 1014	METAL RES. 1W J 1Ω	1330389	←	←	←
R 1015	CHIP RES. 1/10W J 3.3KΩ	RRXAJBBZ0332	←	←	←
R 1016	CHIP RES. 1/10W J 220Ω	RRXAJBBZ0221	←	←	←
R 1017	CHIP RES. 1/10W J 220Ω	RRXAJBBZ0221	←	←	←
R 1018	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 1019	CHIP RES. 1/10W J 18KΩ	RRXAJBBZ0183	←	←	←
R 1020	CHIP RES. 1/10W J 3.9KΩ	RRXAJBBZ0392	←	←	←
R 1021	CHIP RES. 1/10W J 6.8KΩ	RRXAJBBZ0682	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
R 1022	CHIP RES. 1/10W J 220Ω	RRXAJBBZ0221	←	←	←
R 1023	FUSE RES. 1/2W J 10Ω or	5362100	←	←	←
	FUSE RES. 1/2W J 10Ω	RFX2100KA007	←	←	←
R 1024	FUSE RES. 1/2W J 10Ω or	5362100	←	←	←
	FUSE RES. 1/2W J 10Ω	RFX2100KA007	←	←	←
R 1025	METAL RES. 1W J 270KΩ	RN01274KA006	←	←	←
R 1026	METAL RES. 1W J 330KΩ	RN01334KA006	←	←	←
R 1029	CHIP RES. 1/10W J 3.3KΩ	RRXAJBBZ0332	←	←	←
R 1501	CHIP RES. 1/10W J 22KΩ	RRXAJBBZ0223	←	←	←
R 1502	CARBON RES. 1/5W J 15KΩ or	1324153T	←	←	←
	CARBON RES. 1/6W J 15KΩ or	132A153T	←	←	←
	CARBON RES. 1/4W J 15KΩ	RCX4JATZ0153	←	←	←
R 1505	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 1506	CHIP RES. 1/10W J 4.7KΩ	RRXAJBBZ0472	←	←	←
R 1508	CHIP RES. 1/10W J 470Ω	RRXAJBBZ0471	←	←	←
R 1509	CHIP RES. 1/10W J 560Ω	RRXAJBBZ0561	←	←	←
R 1510	CHIP RES. 1/10W J 4.7KΩ	RRXAJBBZ0472	←	←	←
R 1511	CARBON RES. 1/5W J 1KΩ or	1324102T	←	←	←
	CARBON RES. 1/6W J 1KΩ or	132A102T	←	←	←
	CARBON RES. 1/4W J 1KΩ	RCX4JATZ0102	←	←	←
R 1513	CHIP RES. 1/10W J 4.7KΩ	RRXAJBBZ0472	←	←	←
R 1514	CHIP RES. 1/10W J 100KΩ	RRXAJBBZ0104	←	←	←
R 2001	CHIP RES. 1/10W J 110KΩ	RRXAJBBZ0114	←	←	←
R 2002	CHIP RES. 1/10W J 150Ω	RRXAJBBZ0151	←	←	←
R 2004	CHIP RES. 1/10W J 56KΩ	RRXAJBBZ0563	←	←	←
R 2005	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 2006	CHIP RES. 1/10W J 180KΩ	RRXAJBBZ0184	←	←	←
R 2007	CHIP RES. 1/10W J 150KΩ	RRXAJBBZ0154	←	←	←
R 2008	CHIP RES. 1/10W J 2.7KΩ	RRXAJBBZ0272	←	←	←
R 2009	CHIP RES. 1/10W J 56KΩ	RRXAJBBZ0563	←	←	←
R 2010	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 2011	CHIP RES. 1/10W J 56KΩ	RRXAJBBZ0563	←	←	←
R 2012	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 2014	CHIP RES. 1/10W J 150KΩ	RRXAJBBZ0154	←	←	←
R 2015	CHIP RES. 1/10W J 22KΩ	RRXAJBBZ0223	←	←	←
R 2016	CHIP RES. 1/10W J 56KΩ	RRXAJBBZ0563	←	←	←
R 2017	CHIP RES. 1/10W J 56KΩ	RRXAJBBZ0563	←	←	←
R 2018	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 2019	CHIP RES. 1/10W J 22KΩ	RRXAJBBZ0223	←	←	←
R 2020	CHIP RES. 1/10W J 39KΩ	RRXAJBBZ0393	←	←	←
R 2021	CHIP RES. 1/10W J 4.7KΩ	RRXAJBBZ0472	←	←	←
R 2022	CHIP RES. 1/10W J 56KΩ	RRXAJBBZ0563	←	←	←
R 2023	CHIP RES. 1/10W J 0Ω	RRXAJBBZ0000	←	←	←
R 2024	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 2025	CHIP RES. 1/10W J 150KΩ	RRXAJBBZ0154	←	←	←
R 2026	CHIP RES. 1/10W J 0Ω	RRXAJBBZ0000	←	←	←
R 2027	CHIP RES. 1/10W J 100Ω	RRXAJBBZ0101	←	←	←
R 2028	CHIP RES. 1/10W J 100Ω	RRXAJBBZ0101	←	←	←
R 2029	CHIP RES. 1/10W J 2.7KΩ	RRXAJBBZ0272	←	←	←
R 2030	CHIP RES. 1/10W J 2.2KΩ	RRXAJBBZ0222	←	←	←
R 2031	CHIP RES. 1/10W J 390KΩ	RRXAJBBZ0394	←	←	←
R 2034	CHIP RES. 1/10W J 150KΩ	RRXAJBBZ0154	←	←	←
R 2035	CHIP RES. 1/10W J 2.2KΩ	RRXAJBBZ0222	←	←	←
R 3001	CHIP RES. 1/10W J 2.2KΩ	RRXAJBBZ0222	←	←	←
R 3002	CHIP RES. 1/10W J 390Ω	RRXAJBBZ0391	←	←	←
R 3003	CHIP RES. 1/10W J 1.8KΩ	RRXAJBBZ0182	←	←	←
R 3004	CHIP RES. 1/10W J 390Ω	RRXAJBBZ0391	←	←	←
R 3005	CHIP RES. 1/10W J 1.2KΩ	RRXAJBBZ0122	←	←	←
R 3006	CHIP RES. 1/10W J 390Ω	RRXAJBBZ0391	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
R 3007	CHIP RES. 1/10W J 1.5KΩ	RRXAJBBZ0152	←	←	←
R 3008	CHIP RES. 1/10W J 1KΩ	RRXAJBBZ0102	←	←	←
R 3009	CHIP RES. 1/10W J 3.9KΩ	RRXAJBBZ0392	←	←	←
R 3010	CHIP RES. 1/10W J 2.2KΩ	RRXAJBBZ0222	←	←	←
R 3011	CHIP RES. 1/10W J 8.2KΩ	RRXAJBBZ0822	←	←	←
R 3012	CHIP RES. 1/10W J 5.6KΩ	RRXAJBBZ0562	←	←	←
R 3013	CHIP RES. 1/10W J 27KΩ	RRXAJBBZ0273	←	←	←
R 3015	CHIP RES. 1/10W J 2.2KΩ	RRXAJBBZ0222	←	←	←
R 3016	CHIP RES. 1/10W J 180Ω	RRXAJBBZ0181	←	←	←
R 3017	CHIP RES. 1/10W J 1KΩ	RRXAJBBZ0102	←	←	←
R 3018	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 3019	CHIP RES. 1/10W J 390Ω	RRXAJBBZ0391	←	←	←
R 3020	CHIP RES. 1/10W J 2.7KΩ	RRXAJBBZ0272	←	←	←
R 3022	CHIP RES. 1/10W J 470Ω	RRXAJBBZ0471	←	←	←
R 3023	CHIP RES. 1/10W J 820Ω	RRXAJBBZ0821	←	←	←
R 3024	CHIP RES. 1/10W J 820Ω	RRXAJBBZ0821	←	←	←
R 3025	CHIP RES. 1/10W J 3.9KΩ	RRXAJBBZ0392	←	←	←
R 3026	CHIP RES. 1/10W J 1.5KΩ	RRXAJBBZ0152	←	←	←
R 3027	CHIP RES. 1/10W J 8.2KΩ	RRXAJBBZ0822	←	←	←
R 3028	CHIP RES. 1/10W J 1KΩ	RRXAJBBZ0102	←	←	←
R 3029	CHIP RES. 1/10W J 1.5KΩ	RRXAJBBZ0152	←	←	←
R 3030	CHIP RES. 1/10W J 6.8KΩ	RRXAJBBZ0682	←	←	←
R 3031	CHIP RES. 1/10W J 2.7KΩ	RRXAJBBZ0272	←	←	←
R 3033	CHIP RES. 1/10W J 1.2KΩ or	RRXAJBBZ0122	←	←	←
	CHIP RES. 1/10W J 56KΩ	RRXAJBBZ0563	←	←	←
R 3036	METAL RES. 1W J 330Ω	1330419	←	←	←
R 3037	CHIP RES. 1/10W J 1.8KΩ	RRXAJBBZ0182	←	←	←
R 3038	CHIP RES. 1/10W J 12KΩ	RRXAJBBZ0123	←	←	←
R 3039	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 3040	CHIP RES. 1/10W J 4.7KΩ	RRXAJBBZ0472	←	←	←
R 3041	CHIP RES. 1/10W J 2.7KΩ	RRXAJBBZ0272	←	←	←
R 3042	CHIP RES. 1/10W J 1.8KΩ	RRXAJBBZ0182	←	←	←
R 3043	CHIP RES. 1/10W J 2.7KΩ	RRXAJBBZ0272	←	←	←
R 3044	CHIP RES. 1/10W J 470Ω	RRXAJBBZ0471	←	←	←
R 3045	CHIP RES. 1/10W J 470Ω	RRXAJBBZ0471	←	←	←
R 3046	CHIP RES. 1/10W J 2.7KΩ	RRXAJBBZ0272	←	←	←
R 3047	CHIP RES. 1/10W J 560Ω	RRXAJBBZ0561	←	←	←
R 3048	CHIP RES. 1/10W J 2.2KΩ	RRXAJBBZ0222	←	←	←
R 3049	CHIP RES. 1/10W J 390Ω	RRXAJBBZ0391	←	←	←
R 3050	CHIP RES. 1/10W J 1KΩ	RRXAJBBZ0102	←	←	←
R 3051	CHIP RES. 1/10W J 1KΩ	RRXAJBBZ0102	←	←	←
R 3052	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 3053	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 3054	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 3055	CHIP RES. 1/10W J 1MΩ	RRXAJBBZ0105	←	←	←
R 3056	CHIP RES. 1/10W J 8.2KΩ	RRXAJBBZ0822	←	←	←
R 3057	CHIP RES. 1/10W J 4.7KΩ	RRXAJBBZ0472	←	←	←
R 3058	CHIP RES. 1/10W J 8.2KΩ	RRXAJBBZ0822	←	←	←
R 3059	CHIP RES. 1/10W J 2.2KΩ	RRXAJBBZ0222	←	←	←
R 3060	CHIP RES. 1/10W J 18KΩ	RRXAJBBZ0183	←	←	←
R 3061	CHIP RES. 1/10W J 1KΩ	RRXAJBBZ0102	←	←	←
R 3062	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 3064	CHIP RES. 1/10W J 2.2KΩ	RRXAJBBZ0222	←	←	←
R 3068	CHIP RES. 1/10W J 1.5KΩ	RRXAJBBZ0152	←	←	←
R 3074	CHIP RES. 1/10W J 270Ω	RRXAJBBZ0271	←	←	←
R 3075	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 3076	CHIP RES. 1/10W J 820Ω	RRXAJBBZ0821	←	←	←
R 3077	CHIP RES. 1/10W J 22KΩ	RRXAJBBZ0223	←	←	←
R 3078	CHIP RES. 1/10W J 3.9KΩ	RRXAJBBZ0392	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
R 3079	CHIP RES. 1/10W J 0Ω	RRXAJBBZ0000	←	←	←
R 3080	CHIP RES. 1/10W J 22KΩ	RRXAJBBZ0223	←	←	←
R 3081	CHIP RES. 1/10W J 8.2KΩ	RRXAJBBZ0822	←	←	←
R 3082	CHIP RES. 1/10W J 2.7KΩ	RRXAJBBZ0272	←	←	←
R 3083	CHIP RES. 1/10W J 2.2KΩ	RRXAJBBZ0222	←	←	←
R 4001	CHIP RES. 1/10W J 100Ω	RRXAJBBZ0101	←	←	←
R 4002	CHIP RES. 1/10W J 33KΩ	RRXAJBBZ0333	←	←	←
R 4004	CHIP RES. 1/10W J 120Ω	RRXAJBBZ0121	←	←	←
R 4005	CHIP RES. 1/10W J 330KΩ	RRXAJBBZ0334	←	←	←
R 4006	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 4009	CHIP RES. 1/10W J 2.2MΩ	RRXAJBBZ0225	←	←	←
R 4010	CHIP RES. 1/10W J 27KΩ	RRXAJBBZ0273	←	←	←
R 4011	CHIP RES. 1/10W J 5.6KΩ	RRXAJBBZ0562	←	←	←
R 4012	CHIP RES. 1/10W J 2.7KΩ	RRXAJBBZ0272	←	←	←
R 4014	CHIP RES. 1/10W J 1.2KΩ	RRXAJBBZ0122	←	←	←
R 4015	CHIP RES. 1/10W J 1.5KΩ	RRXAJBBZ0152	←	←	←
R 4016	CHIP RES. 1/10W J 560Ω	RRXAJBBZ0561	←	←	←
R 4017	CHIP RES. 1/10W J 560Ω	RRXAJBBZ0561	←	←	←
R 4018	CHIP RES. 1/10W J 22KΩ	RRXAJBBZ0223	←	←	←
R 4019	CHIP RES. 1/10W J 47Ω	RRXAJBBZ0470	←	←	←
R 4020	CHIP RES. 1/10W J 6.8KΩ	RRXAJBBZ0682	←	←	←
R 4021	CHIP RES. 1/10W J 4.7Ω	RRXAJBBZ04R7	←	←	←
R 4022	CARBON RES. 1/5W J 22Ω or	1324220T	←	←	←
	CARBON RES. 1/6W J 22Ω or	132A220T	←	←	←
	CARBON RES. 1/4W J 22Ω	RCX4JATZ0220	←	←	←
R 4023	CHIP RES. 1/10W J 2.2KΩ	RRXAJBBZ0222	←	←	←
R 5102	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 5103	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 6001	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 6002	CHIP RES. 1/10W J 470KΩ	RRXAJBBZ0474	←	←	←
R 6003	CHIP RES. 1/10W J 470KΩ	RRXAJBBZ0474	←	←	←
R 6004	CHIP RES. 1/10W J 180Ω	RRXAJBBZ0181	←	←	←
R 6005	CARBON RES. 1/5W J 4.7Ω or	1324479T	←	←	←
	CARBON RES. 1/6W J 4.7Ω or	132A479T	←	←	←
	CARBON RES. 1/4W J 4.7Ω	RCX4JATZ04R7	←	←	←
R 6006	CARBON RES. 1/5W J 10Ω or	1324100T	←	←	←
	CARBON RES. 1/6W J 10Ω or	132A100T	←	←	←
	CARBON RES. 1/4W J 10Ω	RCX4JATZ0100	←	←	←
R 6008	METAL RES. 1W J 2.7Ω	1330394	←	←	←
R 6011	CHIP RES. 1/10W J 470KΩ	RRXAJBBZ0474	←	←	←
R 6012	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 6013	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 6014	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 6015	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 6018	CHIP RES. 1/10W J 4.7KΩ	RRXAJBBZ0472	←	←	←
R 6019	CHIP RES. 1/10W J 22KΩ	RRXAJBBZ0223	←	←	←
R 6020	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 6021	CHIP RES. 1/10W J 4.7KΩ	RRXAJBBZ0472	←	←	←
R 6022	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 6023	CHIP RES. 1/10W J 1.2KΩ	RRXAJBBZ0122	←	←	←
R 6024	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 6025	CHIP RES. 1/10W J 82KΩ	RRXAJBBZ0823	←	←	←
R 6027	CHIP RES. 1/10W J 22KΩ	RRXAJBBZ0223	←	←	←
R 6028	CHIP RES. 1/10W J 22KΩ	RRXAJBBZ0223	←	←	←
R 6029	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 6030	CHIP RES. 1/10W J 1KΩ	RRXAJBBZ0102	←	←	←
R 6032	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 6033	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 6034	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
R 6035	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 6036	CHIP RES. 1/10W J 4.7KΩ	RRXAJBBZ0472	←	←	←
R 6037	CARBON RES. 1/5W J 2.2KΩ or	1324222T	←	←	←
	CARBON RES. 1/6W J 2.2KΩ or	132A222T	←	←	←
	CARBON RES. 1/4W J 2.2KΩ	RCX4JATZ0222	←	←	←
R 6038	CHIP RES. 1/10W J 15KΩ	RRXAJBBZ0153	←	←	←
R 6039	CHIP RES. 1/10W J 15KΩ	RRXAJBBZ0153	←	←	←
R 6040	CHIP RES. 1/10W J 15KΩ	RRXAJBBZ0153	←	←	←
R 6041	CHIP RES. 1/10W J 39KΩ	RRXAJBBZ0393	←	←	←
R 6042	CHIP RES. 1/10W J 15KΩ	RRXAJBBZ0153	←	←	←
R 6043	CHIP RES. 1/10W J 15KΩ	RRXAJBBZ0153	←	←	←
R 7001	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 7003	CHIP RES. 1/10W J 75Ω	RRXAJBBZ0750	←	←	←
R 7004	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 7005	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 7006	CHIP RES. 1/10W J 6.8KΩ	RRXAJBBZ0682	←	←	←
R 7007	CHIP RES. 1/10W J 5.6KΩ	RRXAJBBZ0562	←	←	←
R 7008	CHIP RES. 1/10W J 15KΩ	RRXAJBBZ0153	←	←	←
R 7009	CHIP RES. 1/10W J 1.2KΩ	RRXAJBBZ0122	←	←	←
R 7010	CHIP RES. 1/10W J 1KΩ	RRXAJBBZ0102	←	←	←
R 7011	CHIP RES. 1/10W J 820Ω	RRXAJBBZ0821	←	←	←
R 7012	CHIP RES. 1/10W J 330KΩ	RRXAJBBZ0334	←	←	←
R 7013	CHIP RES. 1/10W J 18KΩ	RRXAJBBZ0183	←	←	←
R 7014	CHIP RES. 1/10W J 100KΩ	RRXAJBBZ0104	←	←	←
R 7015	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 7016	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 7017	CHIP RES. 1/10W J 6.2KΩ	RRXAJBBZ0622	←	←	←
R 7018	CHIP RES. 1/10W J 56KΩ	RRXAJBBZ0563	←	←	←
R 7019	CHIP RES. 1/10W J 1MΩ	RRXAJBBZ0105	←	←	←
R 7020	CHIP RES. 1/10W J 3.9KΩ	RRXAJBBZ0392	←	←	←
R 7021	CHIP RES. 1/10W J 3.3KΩ	RRXAJBBZ0332	←	←	←
R 7022	CHIP RES. 1/10W J 100KΩ	RRXAJBBZ0104	←	←	←
R 7023	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 7024	CHIP RES. 1/10W J 15KΩ	RRXAJBBZ0153	←	←	←
R 7025	CHIP RES. 1/10W J 56KΩ	RRXAJBBZ0563	←	←	←
R 7026	CHIP RES. 1/10W J 27KΩ	RRXAJBBZ0273	←	←	←
R 7027	CHIP RES. 1/10W J 27KΩ	RRXAJBBZ0273	←	←	←
R 7028	CHIP RES. 1/10W J 27KΩ	RRXAJBBZ0273	←	←	←
R 7029	CHIP RES. 1/10W J 47KΩ	RRXAJBBZ0473	←	←	←
R 7030	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 7031	CARBON RES. 1/5W J 2.2KΩ or	1324222T	←	←	←
	CARBON RES. 1/6W J 2.2KΩ or	132A222T	←	←	←
	CARBON RES. 1/4W J 2.2KΩ	RCX4JATZ0222	←	←	←
R 7032	CARBON RES. 1/5W J 2.2KΩ or	1324222T	←	←	←
	CARBON RES. 1/6W J 2.2KΩ or	132A222T	←	←	←
	CARBON RES. 1/4W J 2.2KΩ	RCX4JATZ0222	←	←	←
R 7033	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 7034	CHIP RES. 1/10W J 100KΩ	RRXAJBBZ0104	←	←	←
R 7501	CHIP RES. 1/10W J 150Ω	RRXAJBBZ0151	←	←	←
R 7502	CHIP RES. 1/10W J 150Ω	RRXAJBBZ0151	←	←	←
R 7503	CHIP RES. 1/10W J 75Ω	RRXAJBBZ0750	←	←	←
R 7504	CHIP RES. 1/10W J 330Ω	RRXAJBBZ0331	←	←	←
R 7505	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 7506	CHIP RES. 1/10W J 330Ω	RRXAJBBZ0331	←	←	←
R 7507	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 7508	CHIP RES. 1/10W J 22KΩ	RRXAJBBZ0223	←	←	←
R 7509	CHIP RES. 1/10W J 10KΩ	RRXAJBBZ0103	←	←	←
R 7510	CHIP RES. 1/10W J 22KΩ	RRXAJBBZ0223	←	←	←
R 7511	CHIP RES. 1/10W J 22KΩ	RRXAJBBZ0223	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
R 7514	CHIP RES. 1/10W J 75Ω	RRXAJBBZ0750	←	←	←
	SWITCHES				
SW5501	PUSH SWITCH EVQ-21509K or	SST0101MS011	←	←	←
	PUSH SWITCH SOR-142HS R66-4519 or	SST0101MM011	←	←	←
	PUSH SWITCH SKHVBH	SST0101AL011	←	←	←
SW5502	PUSH SWITCH EVQ-21509K or	SST0101MS011	←	←	←
	PUSH SWITCH SOR-142HS R66-4519 or	SST0101MM011	←	←	←
	PUSH SWITCH SKHVBH	SST0101AL011	←	←	←
SW5503	PUSH SWITCH EVQ-21509K or	SST0101MS011	←	←	←
	PUSH SWITCH SOR-142HS R66-4519 or	SST0101MM011	←	←	←
	PUSH SWITCH SKHVBH	SST0101AL011	←	←	←
SW5504	PUSH SWITCH EVQ-21509K or	SST0101MS011	←	←	←
	PUSH SWITCH SOR-142HS R66-4519 or	SST0101MM011	←	←	←
	PUSH SWITCH SKHVBH	SST0101AL011	←	←	←
SW5505	PUSH SWITCH EVQ-21509K or	SST0101MS011	←	←	←
	PUSH SWITCH SOR-142HS R66-4519 or	SST0101MM011	←	←	←
	PUSH SWITCH SKHVBH	SST0101AL011	←	←	←
SW5506	PUSH SWITCH EVQ-21509K or	SST0101MS011	←	←	←
	PUSH SWITCH SOR-142HS R66-4519 or	SST0101MM011	←	←	←
	PUSH SWITCH SKHVBH	SST0101AL011	←	←	←
SW5507	PUSH SWITCH EVQ-21509K or	SST0101MS011	←	←	←
	PUSH SWITCH SOR-142HS R66-4519 or	SST0101MM011	←	←	←
	PUSH SWITCH SKHVBH	SST0101AL011	←	←	←
SW5511	PUSH SWITCH EVQ-21509K or	SST0101MS011	←	←	←
	PUSH SWITCH SOR-142HS R66-4519 or	SST0101MM011	←	←	←
	PUSH SWITCH SKHVBH	SST0101AL011	←	←	←
SW5515	PUSH SWITCH EVQ-21509K or	SST0101MS011	←	←	←
	PUSH SWITCH SOR-142HS R66-4519 or	SST0101MM011	←	←	←
	PUSH SWITCH SKHVBH	SST0101AL011	←	←	←
SW5516	PUSH SWITCH EVQ-21509K or	SST0101MS011	←	←	←
	PUSH SWITCH SOR-142HS R66-4519 or	SST0101MM011	←	←	←
	PUSH SWITCH SKHVBH	SST0101AL011	←	←	←
SW6001	SWITCH	SSP0102AL001	←	←	←
SW6002	PUSH SWITCH SW-112-3	SSP0101KB001	←	←	←
SW6003	PUSH SWITCH SKHMPF or	SSP0101AL002	←	←	←
	PUSH SWITCH HKW0602-01-010	SSP0101HD001	←	←	←
	TRANSFORMERS				
T 1001 ⚠	PULSE TRANS ES7927V-A	LTT00EPMS008	←	←	←
T 4001	COIL OSC AUDIO or	1130686	←	←	←
	COIL OSC AUDIO or	113M686	←	←	←
	COIL OSC AUDIO	113D686	←	←	←
	VOLUMES				
VR2001	CARBON P.O.T. 100KΩ or	238A402Y	←	←	←
	CARBON P.O.T. 100KΩ	238A427Y	←	←	←
VR3001	CARBON P.O.T. 4.7KΩ or	238A394Y	←	←	←
	CARBON P.O.T. 5KΩ	238A422Y	←	←	←
VR3002	CARBON P.O.T. 2.2KΩ or	238A392Y	←	←	←
	CARBON P.O.T. 2KΩ	238A420Y	←	←	←
VR3003	CARBON P.O.T. 4.7KΩ or	238A394Y	←	←	←
	CARBON P.O.T. 5KΩ	238A422Y	←	←	←
VR3004	CARBON P.O.T. 4.7KΩ or	238A394Y	←	←	←
	CARBON P.O.T. 5KΩ	238A422Y	←	←	←
VR4001	CARBON P.O.T. 100KΩ or	238A402Y	←	←	←
	CARBON P.O.T. 100KΩ	238A427Y	←	←	←
	CRYSTAL OSCILLATORS				
X 3001	X'TAL 4.433619MHZ or	1811366	←	←	←
	X'TAL 4.433619MHZ	1811388	←	←	←
X 6001	X'TAL 32KHZ (10PPM) or	1811350	←	←	←
	X'TAL 32KHZ (10PPM)	1811351	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
X 6002	CERALOCK 4.19MHZ or	1812885	←	←	←
	CERAMIC RESONATOR EFO-GC4194A4	1813140	←	←	←
X 7001	CERAMIC RESONATOR 500KHZ CSB500E	1810414	←	←	←
	MISCELLANEOUS				
2B 6	HOLDER REEL SENSOR	0VM200965	←	←	←
2B 8	BUSH LED	6N50114	←	←	←
2B 11	SPACER	0VM400719	←	←	←
2L 71	SCREW S-TIGHT BIND HEAD M3X5	GBMS3050	←	←	←
A 17	JACK BOARD	0VM201066	←	←	←
DL3001	COMB FILTER 4.433619MHZ or	1813274	←	←	←
	COMB FILTER 4.433619MHZ	1813522	←	←	←
F 1001 ⚠	FUSE T1.60A/250V or	1790483	←	←	←
	FUSE T1.60A/250V	1790994	←	←	←
F 1002 ⚠	IC PROTECTOR UN10015 or	PBBZZZZMS002	←	←	←
	IC PROTECTOR ICP-N38	PBBZZZZRM001	←	←	←
FH1001	FUSE HOLDER PFC5000-0202	XH01Z00SR001	←	←	←
FH1002	FUSE HOLDER PFC5000-0202	XH01Z00SR001	←	←	←
JK7501	SKIRT JACK 21P CSS5021-1701R	JGZL210SR001	←	←	←
S 6001	DEW SENSOR EYHS77X	PCZHUMZMS005	←	←	←
TP6001	TEST PIN RT-01T-1.3B	5700270	←	←	←
TP6002	TEST PIN RT-01T-1.3B	5700270	←	←	←
TU7001	TUNER/IF/CONVERTOR UNIT TNS-4312-2	UTUNPLBNE007	←	←	←
⚠	AC CORD EP-631-E01	WAE0202NW008	←	←	←
	WIRE ASS'Y	WX1K8000-001	←	←	←
	WIRE 050/GREY/AWG26#1007	WX3801A6FF05	←	←	←
	WIRE 120/RED/AWG26#1007	0VE400367	←	←	←
	WIRE 140/GREY/AWG26#1007	0VE400453	←	←	←
⚠	P.C.B.	BK8020F01001	←	←	←
	LEAD CLAMPER	1790356	←	←	←

VPS PCB ASSEMBLY

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
	ASSEMBLY VPS PCB CONSISTS OF THE FOLLOWING:	NOT USED	←	NOT SUPPLY	←
	CAPACITORS				
C 5101	CERAMIC CAP. B J 0.001μF/50V	NOT USED	←	3B41102T	←
C 5102	CERAMIC CAP. X K 0.0047μF/16V	NOT USED	←	3X4C472T	←
C 5103	CERAMIC CAP. B J 470pF/50V	NOT USED	←	3B41471T	←
C 5104	SEMICONDUCTOR CAP. SR K 0.1μF/25V	NOT USED	←	12Y2104S	←
C 5106	MYLAR CAP. 0.022μF/50V J	NOT USED	←	2254223S	←
C 5107	ELECTROLYTIC CAP. 0.1μF/5.5V Z	NOT USED	←	1220855	←
C 5108	MYLAR CAP. 0.0047μF/50V J	NOT USED	←	2254472S	←
	CONNECTOR				
CN5101	ANGLE SOCKET CONNECTOR 8P	NOT USED	←	1770603	←
	DIODES				
D 5101	DIODE 1SS254	NOT USED	←	A1SS254T77**	←
D 5501	DIODE 1SS254	NOT USED	←	A1SS254T77**	←
D 5502	DIODE 1SS254	NOT USED	←	A1SS254T77**	←
D 5503	DIODE 1SS254	NOT USED	←	A1SS254T77**	←
	INTERGRATED CIRCUIT				
IC5101	IC VPS SAA4700	NOT USED	←	14D0738	←
	RESISTORS				
R 5101	CARBON RES. 1/5W J 4.7KΩ	NOT USED	←	1324472T	←
R 5104	CARBON RES. 1/5W J 75KΩ	NOT USED	←	1324753T	←
R 5105	CARBON RES. 1/5W J 8.2KΩ	NOT USED	←	1324822T	←
R 5106	CARBON RES. 1/5W J 56Ω	NOT USED	←	1324560T	←
	MISCELLANEOUS				
⚠	P.C.B.	NOT USED	←	BK8036F01001	←

TMV PCB ASSEMBLY

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
	ASSEMBLY TMV PCB CONSISTS OF THE FOLLOWING:	NOT SUPPLY	←	←	←
	CAPACITOR				
C 5501	ELECTROLYTIC CAP. 47μF/6.3V M	126A476	←	←	←
	CONNECTORS				
CN5501	HINGED SOCKET CONNECTOR 8P	JCTRG08TG002	←	←	←
CN5502	HINGED SOCKET CONNECTOR 18P	JCTRG18TG002	←	←	←
	COIL				
L 5501	INDUCTOR 220UH-K or	LLAXKD*KA221	←	←	←
	INDUCTOR 220UH-K	LLAXKA*TU221	←	←	←
	RESISTORS				
R 5501	CARBON RES. 1/5W J 10KΩ or	1324103	←	←	←
	CARBON RES. 1/6W J 10KΩ or	132A103	←	←	←
	CARBON RES. 1/4W J 10KΩ	RCX4JZPZ0103	←	←	←
R 5502	CARBON RES. 1/4W J 6.8Ω	RCX4JZPZ06R8	←	←	←
	MISCELLANEOUS				
2B 4	HOLDER F.I.P.(L)	0VM200971	←	←	←
2B 5	HOLDER F.I.P.(R)	0VM200972	←	←	←
2B 9	FILM CONDUCTOR	6E52011	←	←	←
FP5501	F.I.P. 10-BT-103GBK or	TVFD1C0FT019	←	←	←
	F.I.P. FIP10BQM6A	TVFD1C0NE019	←	←	←
RS5501	REMOTE CONTROL UNIT RCDHC-278 or	USESJRSKK008	←	←	←
	REMOTE SENSOR UNIT SFN-R0011	1812501	←	←	←
⚠	P.C.B.	BK8030F01001	←	←	←

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
X 6002	CERALOCK 4.19MHZ or	1812885	←	←	←
	CERAMIC RESONATOR EFO-GC4194A4	1813140	←	←	←
X 7001	CERAMIC RESONATOR 500KHZ CSB500E	1810414	←	←	←
	MISCELLANEOUS				
2B 6	HOLDER REEL SENSOR	0VM200965	←	←	←
2B 8	BUSH LED	6N50114	←	←	←
2B 11	SPACER	0VM400719	←	←	←
2L 71	SCREW S-TIGHT BIND HEAD M3X5	GBMS3050	←	←	←
A 17	JACK BOARD	0VM201066	←	←	←
DL3001	COMB FILTER 4.433619MHZ or	1813274	←	←	←
	COMB FILTER 4.433619MHZ	1813522	←	←	←
F 1001 ⚠	FUSE T1.60A/250V or	1790483	←	←	←
	FUSE T1.60A/250V	1790994	←	←	←
F 1002 ⚠	IC PROTECTOR UN10015 or	PBBZZZZMS002	←	←	←
	IC PROTECTOR ICP-N38	PBBZZZZRM001	←	←	←
FH1001	FUSE HOLDER PFC5000-0202	XH01Z00SR001	←	←	←
FH1002	FUSE HOLDER PFC5000-0202	XH01Z00SR001	←	←	←
JK7501	SKIRT JACK 21P CSS5021-1701R	JGZL210SR001	←	←	←
S 6001	DEW SENSOR EYHS77X	PCZHUMZMS005	←	←	←
TP6001	TEST PIN RT-01T-1.3B	5700270	←	←	←
TP6002	TEST PIN RT-01T-1.3B	5700270	←	←	←
TU7001	TUNER/IF/CONVERTOR UNIT TNS-4312-2	UTUNPLBNE007	←	←	←
⚠	AC CORD EP-631-E01	WAE0202NW008	←	←	←
	WIRE ASS'Y	WX1K8000-001	←	←	←
	WIRE 050/GREY/AWG26#1007	WX3801A6FF05	←	←	←
	WIRE 120/RED/AWG26#1007	0VE400367	←	←	←
	WIRE 140/GREY/AWG26#1007	0VE400453	←	←	←
⚠	P.C.B.	BK8020F01001	←	←	←
	LEAD CLAMPER	1790356	←	←	←

VPS PCB ASSEMBLY

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
	ASSEMBLY VPS PCB CONSISTS OF THE FOLLOWING:	NOT USED	←	NOT SUPPLY	←
	CAPACITORS				
C 5101	CERAMIC CAP. B J 0.001μF/50V	NOT USED	←	3B41102T	←
C 5102	CERAMIC CAP. X K 0.0047μF/16V	NOT USED	←	3X4C472T	←
C 5103	CERAMIC CAP. B J 470pF/50V	NOT USED	←	3B41471T	←
C 5104	SEMICONDUCTOR CAP. SR K 0.1μF/25V	NOT USED	←	12Y2104S	←
C 5106	MYLAR CAP. 0.022μF/50V J	NOT USED	←	2254223S	←
C 5107	ELECTROLYTIC CAP. 0.1μF/5.5V Z	NOT USED	←	1220855	←
C 5108	MYLAR CAP. 0.0047μF/50V J	NOT USED	←	2254472S	←
	CONNECTOR				
CN5101	ANGLE SOCKET CONNECTOR 8P	NOT USED	←	1770603	←
	DIODES				
D 5101	DIODE 1SS254	NOT USED	←	A1SS254T77**	←
D 5501	DIODE 1SS254	NOT USED	←	A1SS254T77**	←
D 5502	DIODE 1SS254	NOT USED	←	A1SS254T77**	←
D 5503	DIODE 1SS254	NOT USED	←	A1SS254T77**	←
	INTERGRATED CIRCUIT				
IC5101	IC VPS SAA4700	NOT USED	←	14D0738	←
	RESISTORS				
R 5101	CARBON RES. 1/5W J 4.7KΩ	NOT USED	←	1324472T	←
R 5104	CARBON RES. 1/5W J 75KΩ	NOT USED	←	1324753T	←
R 5105	CARBON RES. 1/5W J 8.2KΩ	NOT USED	←	1324822T	←
R 5106	CARBON RES. 1/5W J 56Ω	NOT USED	←	1324560T	←
	MISCELLANEOUS				
⚠	P.C.B.	NOT USED	←	BK8036F01001	←

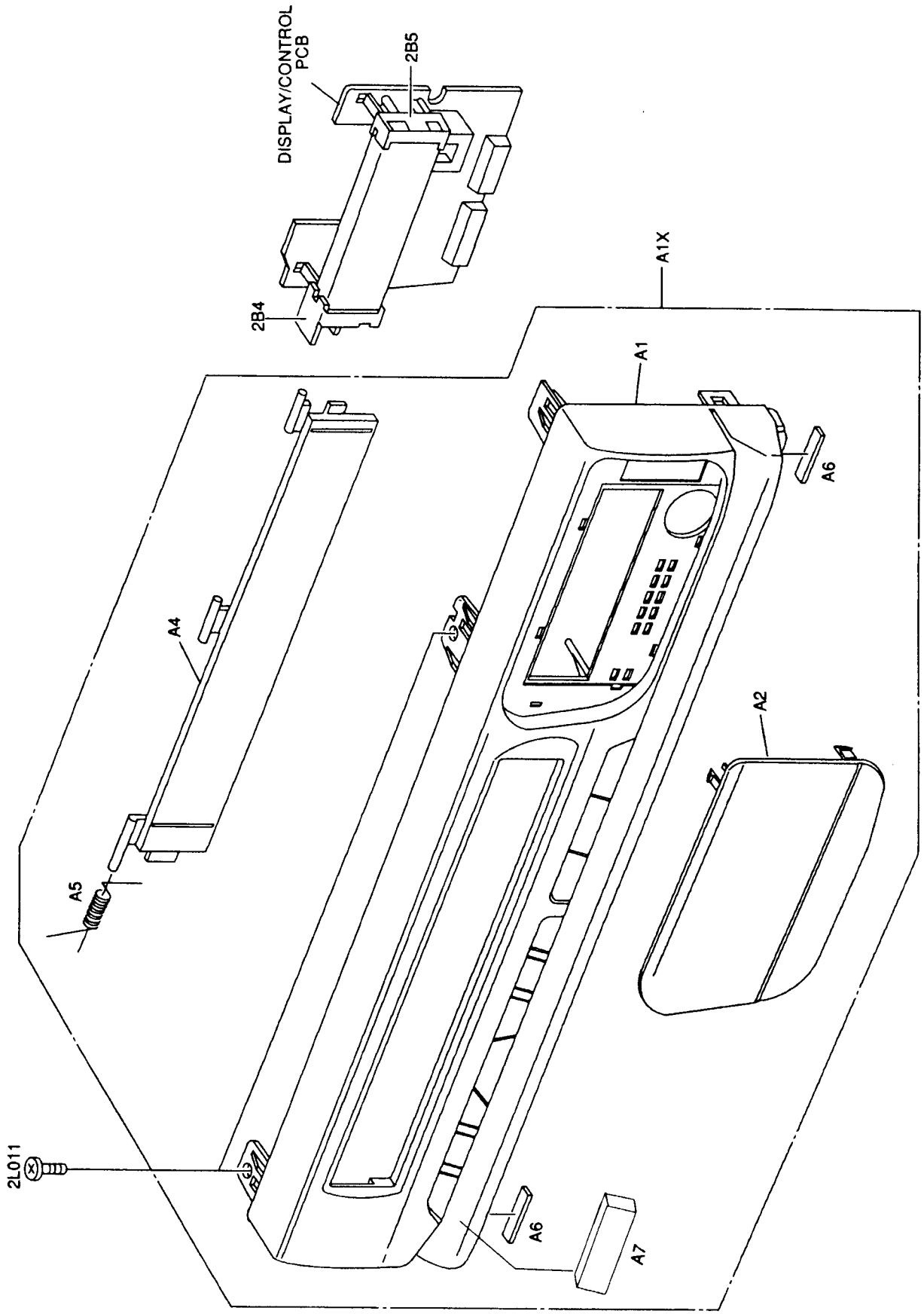
TMV PCB ASSEMBLY

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
	ASSEMBLY TMV PCB CONSISTS OF THE FOLLOWING:	NOT SUPPLY	←	←	←
	CAPACITOR				
C 5501	ELECTROLYTIC CAP. 47μF/6.3V M	126A476	←	←	←
	CONNECTORS				
CN5501	HINGED SOCKET CONNECTOR 8P	JCTRG08TG002	←	←	←
CN5502	HINGED SOCKET CONNECTOR 18P	JCTRG18TG002	←	←	←
	COIL				
L 5501	INDUCTOR 220UH-K or	LLAXKD*KA221	←	←	←
	INDUCTOR 220UH-K	LLAXKA*TU221	←	←	←
	RESISTORS				
R 5501	CARBON RES. 1/5W J 10KΩ or	1324103	←	←	←
	CARBON RES. 1/6W J 10KΩ or	132A103	←	←	←
	CARBON RES. 1/4W J 10KΩ	RCX4JZPZ0103	←	←	←
R 5502	CARBON RES. 1/4W J 6.8Ω	RCX4JZPZ06R8	←	←	←
	MISCELLANEOUS				
2B 4	HOLDER F.I.P.(L)	0VM200971	←	←	←
2B 5	HOLDER F.I.P.(R)	0VM200972	←	←	←
2B 9	FILM CONDUCTOR	6E52011	←	←	←
FP5501	F.I.P. 10-BT-103GBK or	TVFD1C0FT019	←	←	←
	F.I.P. FIP10BQM6A	TVFD1C0NE019	←	←	←
RS5501	REMOTE CONTROL UNIT RCDHC-278 or	USESJRSKK008	←	←	←
	REMOTE SENSOR UNIT SFN-R0011	1812501	←	←	←
⚠	P.C.B.	BK8030F01001	←	←	←

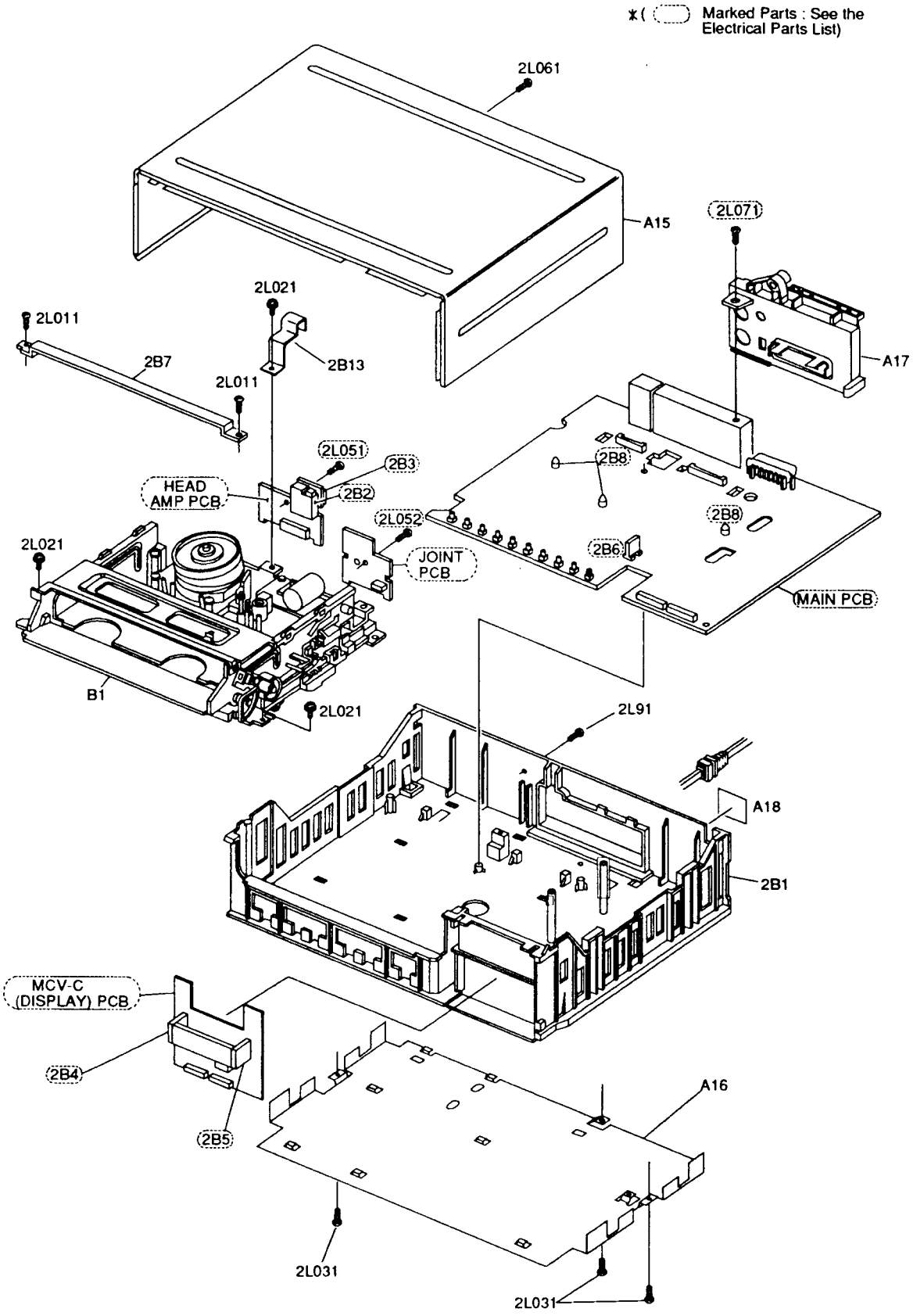
PRV PCB ASSEMBLY

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
	ASSEMBLY PRV PCB CONSISTS OF THE FOLLOWING:	NOT SUPPLY	←	←	←
	CAPACITORS				
C 3501	CHIP CERAMIC CAP. F Z 0.1μF/16V	CHE1CZB0F104	←	←	←
C 3502	ELECTROLYTIC CAP. 47μF/6.3V M H7	526R476S	←	←	←
C 3503	ELECTROLYTIC CAP. 0.22μF/50V M H7	526W224S	←	←	←
C 3504	CHIP CERAMIC CAP. B K 0.01μF/25V	CHE1EKB0B103	←	←	←
C 3505	CHIP CERAMIC CAP. B K 0.01μF/25V	CHE1EKB0B103	←	←	←
C 3506	CHIP CERAMIC CAP. B K 0.01μF/25V	CHE1EKB0B103	←	←	←
C 3507	CHIP CERAMIC CAP. F Z 0.1μF/16V	CHE1CZB0F104	←	←	←
C 3509	CHIP CERAMIC CAP. F Z 0.1μF/16V	CHE1CZB0F104	←	←	←
C 3513	CHIP CERAMIC CAP. SL J 15pF/50V	CHE1JJBSL150	←	←	←
	CONNECTORS				
CN3501	ANGLE SOCKET CONNECTOR 15P	1770610	←	←	←
CN3502	FFC CONNECTOR BASE SIDE 5P or	JC96J05ERC0C	←	←	←
	FFC CONNECTOR BASE SIDE 5P	1700471	←	←	←
CN3503	ANGLE PIN HEADER 2P	1740775	←	←	←
	INTERGRATED CIRCUIT				
IC3501	IC LA7370	GLA7370*****	←	←	←
	COIL				
L 3501	INDUCTOR 22UH-K-26T or	LLAXKDTKA220	←	←	←
	INDUCTOR 22UH-K-26T	LLAXKATTU220	←	←	←
	RESISTORS				
R 3501	CHIP RES. 1/10W J 22KΩ	RRXAJBBZ0223	←	←	←
R 3502	CHIP RES. 1/10W J 8.2KΩ	RRXAJBBZ0822	←	←	←
R 3503	CHIP RES. 1/10W J 1KΩ	RRXAJBBZ0102	←	←	←
R 3504	CHIP RES. 1/10W J 5.6KΩ	RRXAJBBZ0562	←	←	←
R 3505	CHIP RES. 1/10W J 33KΩ	RRXAJBBZ0333	←	←	←
	MISCELLANEOUS				
2B 2	SHIELD TOP	0VM301187	←	←	←
2B 3	SHIELD BOTTOM	0VM301186	←	←	←
CL3501	LEAD ASS'Y 2P	WX1K7010-004	←	←	←
CL3502	JUMPER WIRE 6P AWG26#20080/P2.0/40	WX1K7010-002	←	←	←
⚠	P.C.B.	BK8020F01003	←	←	←

FRONT EXPLODED VIEW



CABINET EXPLODED VIEW



MECHANICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice of this service manual. Don't degrade the safety of the product through improper servicing.
*Tolerance of Capacitors and Resistors are noted with the following symbols.

REF NO.	DESCRIPTION	PART NO. 4A-005	PART NO. 4A-015	PART NO. 4A-025	PART NO. 4A-035
A 1X ⚠	FRONT ASS'Y	0VM201130	0VM201134	0VM201135	0VM201136
A 1	FRONT PANEL ASS'Y	0VM201130X	0VM201134X	0VM201135X	0VM201136X
A 2	PANEL COUNTER	0VM403915	←	←	←
A 4	DOOR CASSETTE	0VM403917	←	←	←
A 5	SPRING DOOR	0VM403265	←	←	←
A 6	FOOT	0VM403657	←	←	←
A 7	BADGE	6D52254	←	←	←
A 15	CASE TOP	0VM100340	←	←	←
A 16	PANEL BOTTOM	0VM100339	←	0VM201120	←
A 18 ⚠	LABEL RATING	0VM403779	0VM403799	0VM403800	0VM403801
B 1	DECK ASS'Y JPD001/VM1100	N1100XA	←	←	←
2B 1	CHASSIS	0VM000025	←	←	←
2B 7	HOLDER DECK	0VM301276	←	←	←
2B 13	DECK SUPPORTER	0VM403697	←	←	←
2L 011	SCREW P-TIGHT BIND HEAD 3X10	GBMP3100	←	←	←
2L 021	SCREW P-TIGHT WASHER HEAD M3X10	GCMP3100	←	←	←
2L 031	SCREW RAMI-TIGHT BIND HEAD M3X10	DZM23100	←	←	←
2L 061	SCREW P-TIGHT BIND HEAD 4X12	GBKP4120	←	←	←
2L 091	SCREW S-TIGHT 3X8	GBKS3080	←	←	←
	ACCESSORY KIT				
X 1	REMOCON BOX	UREMT28XW033	UREMT38SR002	UREMT28XW033	UREMT38SR002
X 2 ⚠	OWNER'S MANUAL	0VMN00991	←	←	←
X 3	RF CORD PAL 1.2M	WPZ0122TM001	←	←	←

IC PIN FUNCTION DESCRIPTIONS

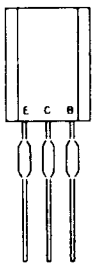
NOTE: With ✳ L<2.3V, H≥2.7V
Without ✳ L<0.5V, H≥4.6V

SYSCON/TIMER (QSMQAORNE008)

PIN NO.	IN/OUT	SIGNAL NAME	FUNCTION	ACTIVE LEVEL
1	IN	REEL	Take Up Reel Rotation Signal Input	✳ H/L
2	—	A V_{REF}	+5V	—
3	—	A V_{DD}	+5V	—
4	—	V_{DD}	+5V	—
5	—	V_{PP}	+5V	—
6	OUT	X_2	Crystal Oscillator (4.19MHz Output)	—
7	IN	X_1	Crystal Oscillator (4.19MHz Input)	—
8	—	IC	GND	—
9	OUT	XT_2	Crystal Oscillator (32KHz Output)	—
10	IN	XT_1	Crystal Oscillator (32KHz Input)	—
11	—	V_{SS}	GND	—
12	—	—	—	—
13	OUT	LD-FWD	Loading Motor Forward Control Output (Forward/Stop= "H")	H
14	OUT	LD-REV	Loading Motor Reverse Control Output (Reverse/Stop= "H")	H
15	OUT	LED-P	Pulse Output Signal for Sensor (for ST/END SENSOR)	H/L
16	OUT	V-MUTE	Video Mute Signal	H
17	OUT	EXT-H	External Input Signal (External Input= "H" output)	H
18	OUT	50/60 OUT	PAL/NTSC Changing Output at On PAL Position (Not used)	L (PAL)
19	OUT	D-REC	Delayed Record Control Signal (Record ="H")	H
20	OUT	a	Display Segment Control Signal Output/Kye Scan Signal Output	VPP/H
21	OUT	b	Display Segment Control Signal Output/Kye Scan Signal Output	VPP/H
22	OUT	c	Display Segment Control Signal Output/Kye Scan Signal Output	VPP/H
23	OUT	d	Display Segment Control Signal Output/Kye Scan Signal Output	VPP/H
24	OUT	e	Display Segment Control Signal Output/Kye Scan Signal Output	VPP/H
25	OUT	f	Display Segment Control Signal Output/Kye Scan Signal Output	VPP/H
26	OUT	g	Display Segment Control Signal Output/Kye Scan Signal Output	VPP/H
27	OUT	h	Display Segment Control Signal Output/Kye Scan Signal Output	VPP/H
28	OUT	i	Display Segment Control Signal Output/Kye Scan Signal Output	VPP/H
29	OUT	j	Display Segment Control Signal Output	VPP
30	—	V_{DD}	+5V	—
31	—	V_{LOAD}	-30V	—
32	OUT	A-CONT 0	Audio Control Signal 0 (Not used)	H/L
33	OUT	A-CONT 1	Audio Control Signal 1 (Not used)	H/L
34	OUT	AFT-DEF	AFT Defeat Signal	H
35	OUT	VPS-CHK	VPS-Check Signal	H
36	OUT	BAND 0	Tuner Band Set Signal 0	H
37	OUT	BAND 1	Tuner Band Set Signal 1	H
38	OUT	G 10	Display Grid Control Output	—
39	OUT	G 9	Display Grid Control Output	—
40	OUT	G 8	Display Grid Control Output	—
41	OUT	G 7	Display Grid Control Output	—
42	OUT	G 6	Display Grid Control Output	—
43	OUT	G 5	Display Grid Control Output	—
44	OUT	G 4	Display Grid Control Output	—
45	OUT	G 3	Display Grid Control Output	—
46	OUT	G 2	Display Grid Control Output	—

PIN NO.	IN/OUT	SIGNAL NAME	FUNCTION	ACTIVE LEVEL
47	OUT	G 1	Display Grid Control Output	—
48	—	V_{DD}	+5V	—
49	IN	SD	Tuner Video Signal Sync Input "L" at Sync Signal	L
50	IN	P-SFT	Power Voltage Failure Detect= "L" When Power On	L
51	IN	CAS-SW	Cassette IN/OUT Detector (IN/OUT Rotation= "H")	H
52	OUT	T-DAC	Tuner Tuning Voltage Control Signal	H or L
53	OUT	PAUSE	Pause Control	L
54	OUT	$\overline{\text{P-ON}}$	Power On Signal	L
55	OUT	C-F/R	Capstan Motor FWD/REV Control Signal (Forward= "L",Reverse ="H")	H/L
56	OUT	C-DRIVE	Capstan Motor Drive Signal Output (Rotation ="H",Stop ="L")	H
57	IN	DEW	Dew Sensor	L
58	IN	P-DOWN	Power Failure Derection Signal (Usually ="H",Power Voltage Down ="L")	L
59	OUT	S-DATA	Servo IC Data	—
60	OUT	S-CLOCK	Servo IC Timing Clock	—
61	OUT	DM-ON	Drum Rotation Control Signal Output (Rotation ="H")	H
62	OUT	A-MUTE	Sound Mute Signal	H
63	OUT	TV/$\overline{\text{VCR}}$	RF Modulator ON/OFF Signal (VCR Mode ="L")	L
64	—	—	—	—
65	—	V_{SS}	GND	—
66	IN	LD-D	Tape Loading Position Detector	—
67	IN	LD-C	Tape Loading Position Detector	—
68	IN	LD-B	Tape Loading Position Detector	—
69	IN	LD-A	Tape Loading Position Detector	—
70	IN/OUT	SDA	Memory IC Data	H/L
71	OUT	SCL	Memory IC Timing Clock	H
72	IN/OUT	VPS-DATA	VPS Interface Data H/L (VPT Interface Data H/L)	H/L
73	OUT	VPS-CLK	VPS Interface Clock (VPT Interface Clock)	H
74	OUT	TRIM OUT	Trimming Out	—
75	OUT	B/G-H	PAL/SECAM Changing Output (BG/DK,D/I Changing Output)	H
76	OUT	TV-SP	Canal Signal On/Off Detection Output (Not used)	L
77	OUT	$\overline{\text{D-PB}}$	Video/Audio Playback Control Output (Playback ="L")	L
78	IN	TRIM IN	Trimming IN	—
79	IN	RF-SW	Head Switching Pulse	H/L
80	IN	CTL-P	Control Pulse In	—
81	IN	REMOCON	Remote Control Input Signal	H
82	IN	KI 0	Key Scan Signal Input	H
83	IN	KI 1	Key Scan Signal Input	H
84	IN	KI 2	Key Scan Signal Input	H
85	IN	REC-SAF	Record Safety Tab Detect ("L" =Exsisting,"H" =None)	L
86	IN	$\overline{\text{RESET}}$	System Reset Signal (Usually ="H",Record ="L")	L
87	—	A V_{SS}	GND	—
88	IN	KI 3	Key Scan Signal Input	H
89	IN	KI 4	Key Scan Signal Input	H
90	IN	AFC	Tuner AFC Voltage Input	—
91				
92	IN	ENV-D	Video Envelop Level Input	—
93	IN	START-S	Tape Start Position Detector	L
94	IN	END-S	Tape End Position Detector	L

LEAD IDENTIFICATIONS



DTA124
DTA143
DTA144
DTC124
A1346

2SA608
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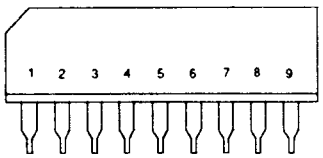
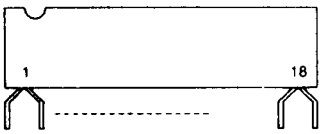
LA7910



BA7025



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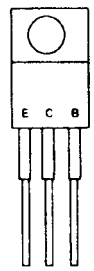

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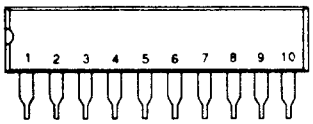

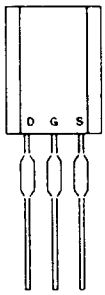

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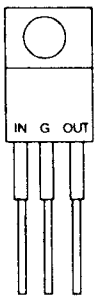

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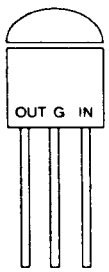

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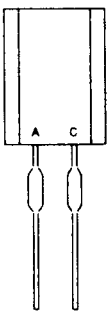
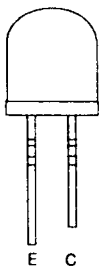


L5631

A: Anode
C: Cathode



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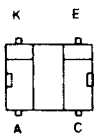

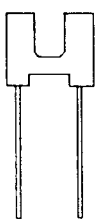

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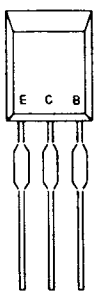

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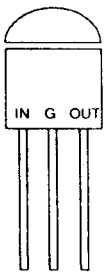

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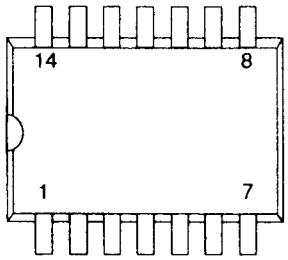

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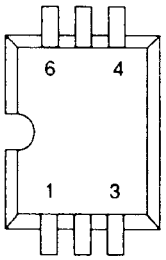

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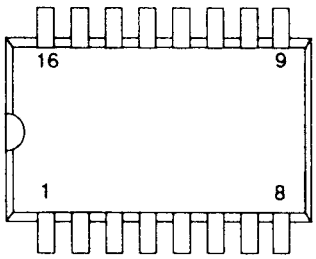

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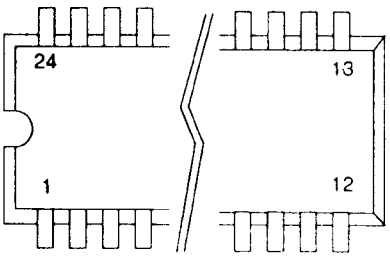

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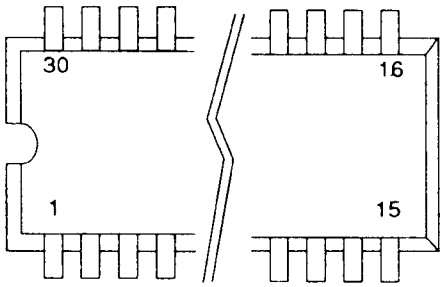

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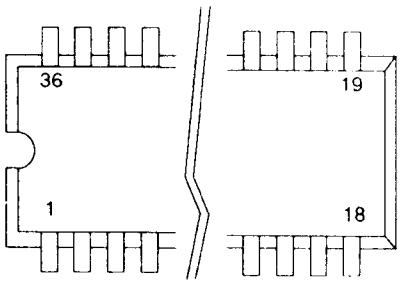

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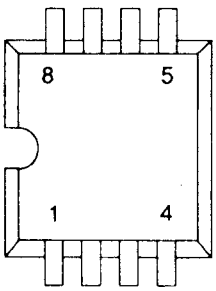

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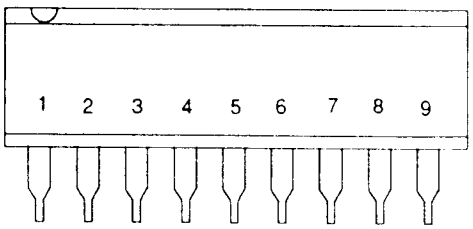

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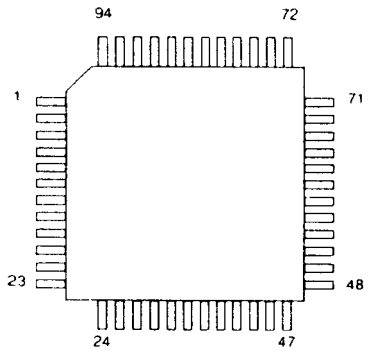

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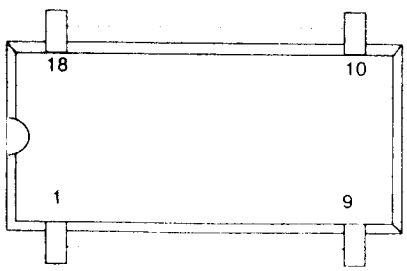
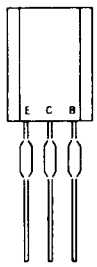


(With VPS Model)

LEAD IDENTIFICATIONS



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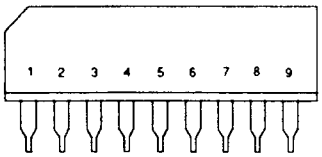

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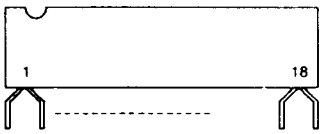
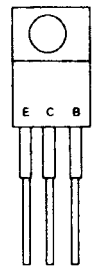


(With MESECAM Model)



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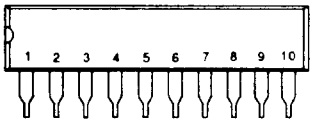

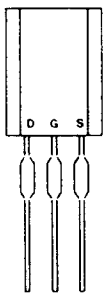

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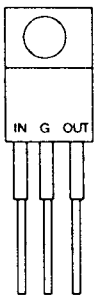

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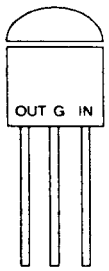

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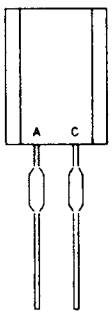
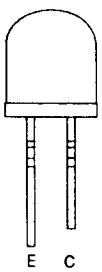


L5631

A: Anode
C: Cathode



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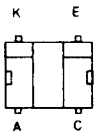

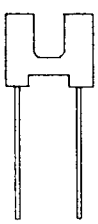

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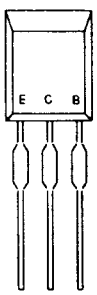

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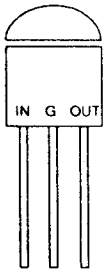

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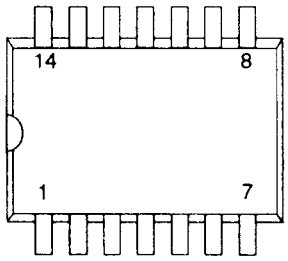

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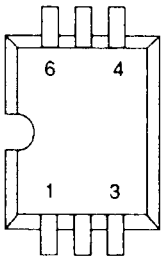

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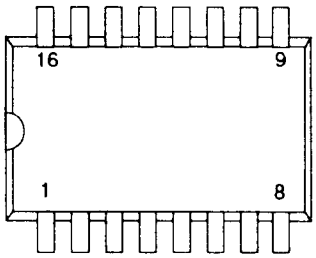

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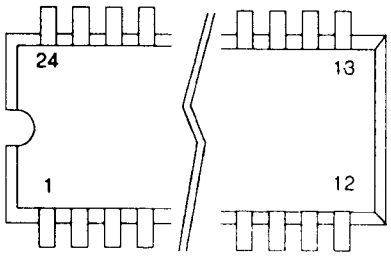

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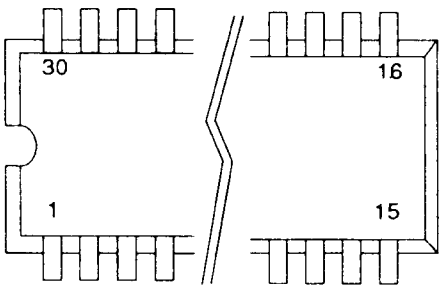

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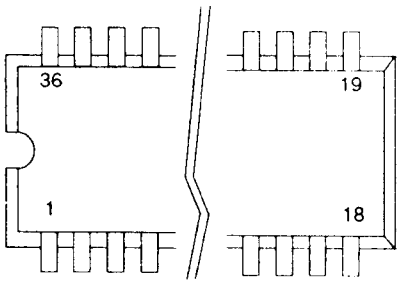

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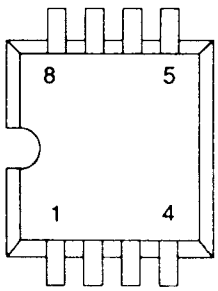

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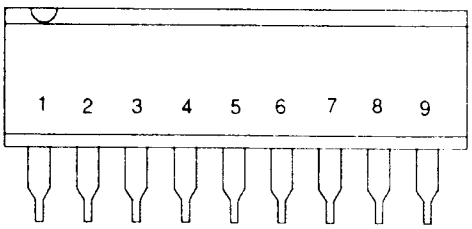

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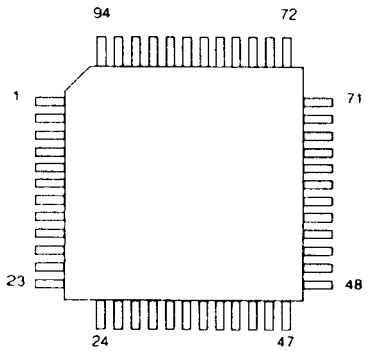

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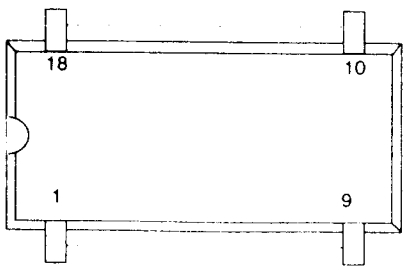

(With VPS Model)

DECK MECHANISM SECTION

TYPE NO. N1100XA/N1101XA

VIDEO RECORDER

DECK MECHANISM SECTION

CONTENTS

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STANDARD MAINTENANCE

SERVICE SCHEDULE OF COMPONENTS

❍:Check ●:Change

Deck		Periodic Service Schedule			
Ref. No.	Parts Name	1,000 H	2,000 H	3,000 H	4,000 H
B2	Cylinder Ass'y	❍	●	❍	●
B3	Loading Motor			●	
B7	Pinch Roller Arm Ass'y		●		●
B8	Pulley Sub Ass'y		●		●
B21	Belt LDG		●		●
B26	Clutch Block Assembly		●		●
B27	Band Break Ass'y		●		●
B28	Main Break S Ass'y		●		●
B29	Main Break T Ass'y		●		●
B30	T Break Arm Ass'y		●		●
B31	AC Head Ass'y			●	
B32, B33	Reel Assembly			●	
B37	Capstan Motor		●		●
B52	Belt FWD		●		●
B54	Drum Ground			●	
* B73	Full Erase Head			●	
☆ B86	F Break Ass'y		●		●

Note:

1. Clean all parts for the tape transport (Upper Drum with video head / Pinch Roller / Audio Control Head / Full Erase Head) using 91% Isoprophyl Alcohol.
2. After cleaning up the parts, perform all DECK ADJUSTMENTS.
3. All Reference Numbers listed above refer to parts shown on Deck Exploded View .
4. Parts marked ☆ are used in 4 head model only.
5. Parts marked * is used in Rec / Play model only.

CLEANING

1. Cleaning of Video Head

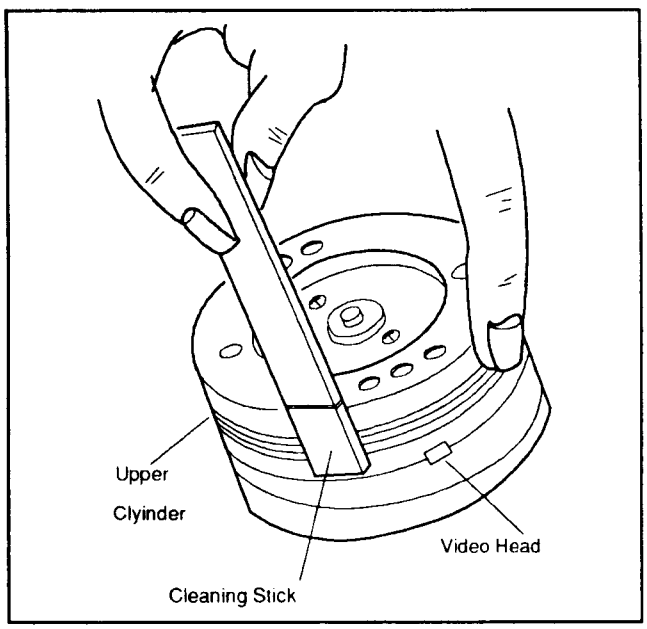
Use a Head Cleaning Stick or Chamois Skin

Procedure

1. Remove the top cabinet.
2. Put on a glove (thin type) to avoid touching the upper drum and lower drum with bare hands.
3. Put a few drops of alcohol on the Head Cleaning Stick, and by slightly placing it against the head tip, allow the upper drum to turn to the right and left.

NOTE:

1. The video head is very hard material, but since it is very thin, avoid cleaning it vertically.
2. Wait for the cleaned part to dry out before operating the unit.
3. Do not reuse the stained Head Cleaning Stick.



2. Cleaning of Audio Control Head

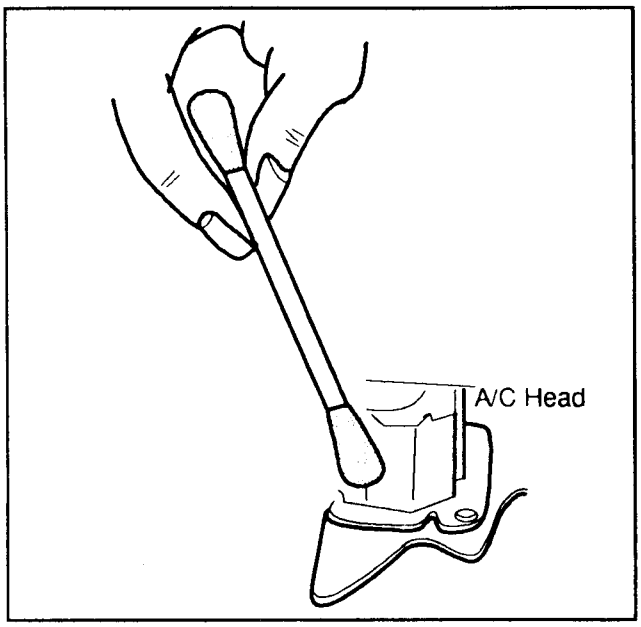
Use a cotton swab (Q-Tip)

Procedure

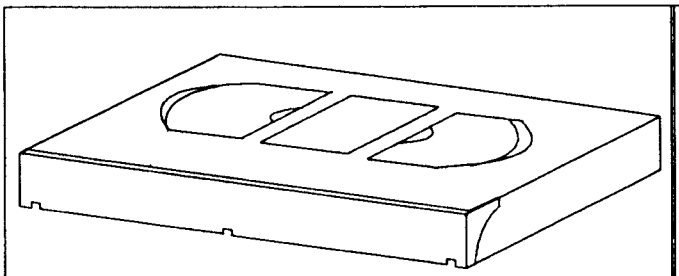
1. Remove the top cabinet.
2. Put a few drops of alcohol on the cotton swab, and clean up the audio control head, being careful not to damage the upper drum and other tape running parts.

NOTE:

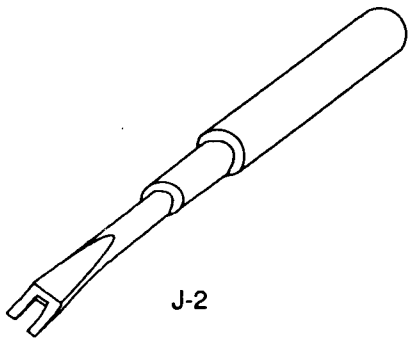
1. Avoid cleaning audio control head vertically.
2. Wait for the cleaned part to dry out, before operating the unit, or damage will occur.



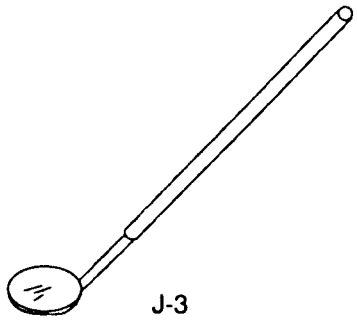
SERVICE FIXTURES AND TOOLS



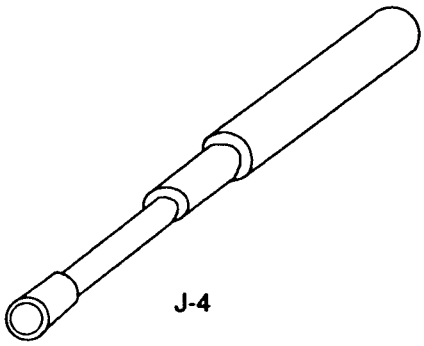
J-1-1, J-1-2



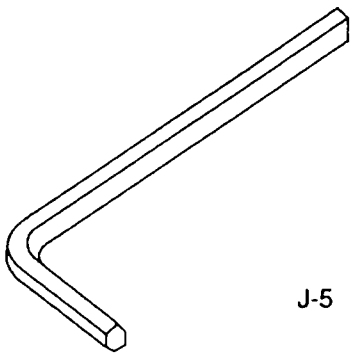
J-2



J-3



J-4



J-5

Ref. No	Name	Adjustment
J-1-1	Alignment Tape (F6-A)	Head Adjustment of Audio Control Head
J-1-2	Alignment Tape (F6-N): 2 Head Model	Azimuth Adjustment of Audio Control Head / X Value
	Alignment Tape (F6-NS): 4 Head Model	/ Confirmation / Adiustment of Envelope Waveform
	Alignment Tape (F6-NF): 4 Head model	
J-2	Special Driver (FSJ-0001)	Tape Guide Height
J-3	Mirror (FSJ-0004)	Tape Transportation Check
J-4	Box Driver, Mx3 (FSJ-0005)	Guide Pole / A/C Head Height
J-5	Hexagon Wrench (0.9mm)(FSJ-0002)	Confirmation and Adjustment of Tape Running
	Hexagon Wrench (1.5mm)(FSJ-0003)	Confirmation and Adjustment of Tape Running

MECHANICAL ALIGNMENT PROCEDURES

SERVICE INFORMATION

A. Method for Manual Tape Loading/Unloading of VCR.
To place the Cassette Holder in the down position, turn the Pulley Ass'y clockwise inserting a tape. To be placed in the up position, turn the Pulley Ass'y counterclockwise.

B. How to place the Cassette Holder in the down position without a cassette tape.
METHOD
1. Disconnect AC Plug and remove the Top Cover.
2. Cover the LED Sensors below of Prism L and Prism R.
Note: When handling Tape Sensor, take care of the Static Electricity.
3. Turn the Pulley Ass'y clockwise.

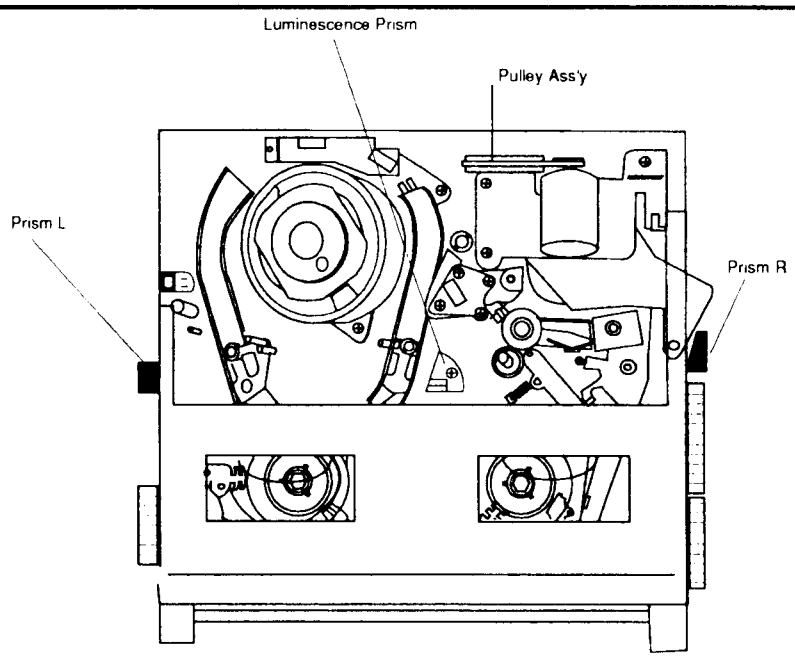


Fig. M1

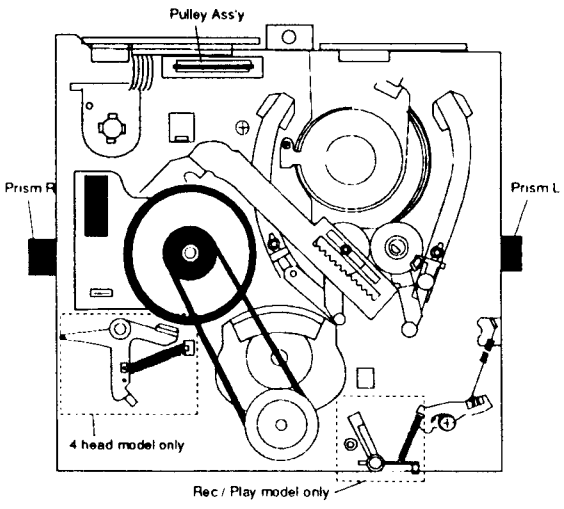


Fig. M2

1. TAPE INTERCHANGEABILITY ALIGNMENT (FINAL ALIGNMENT)

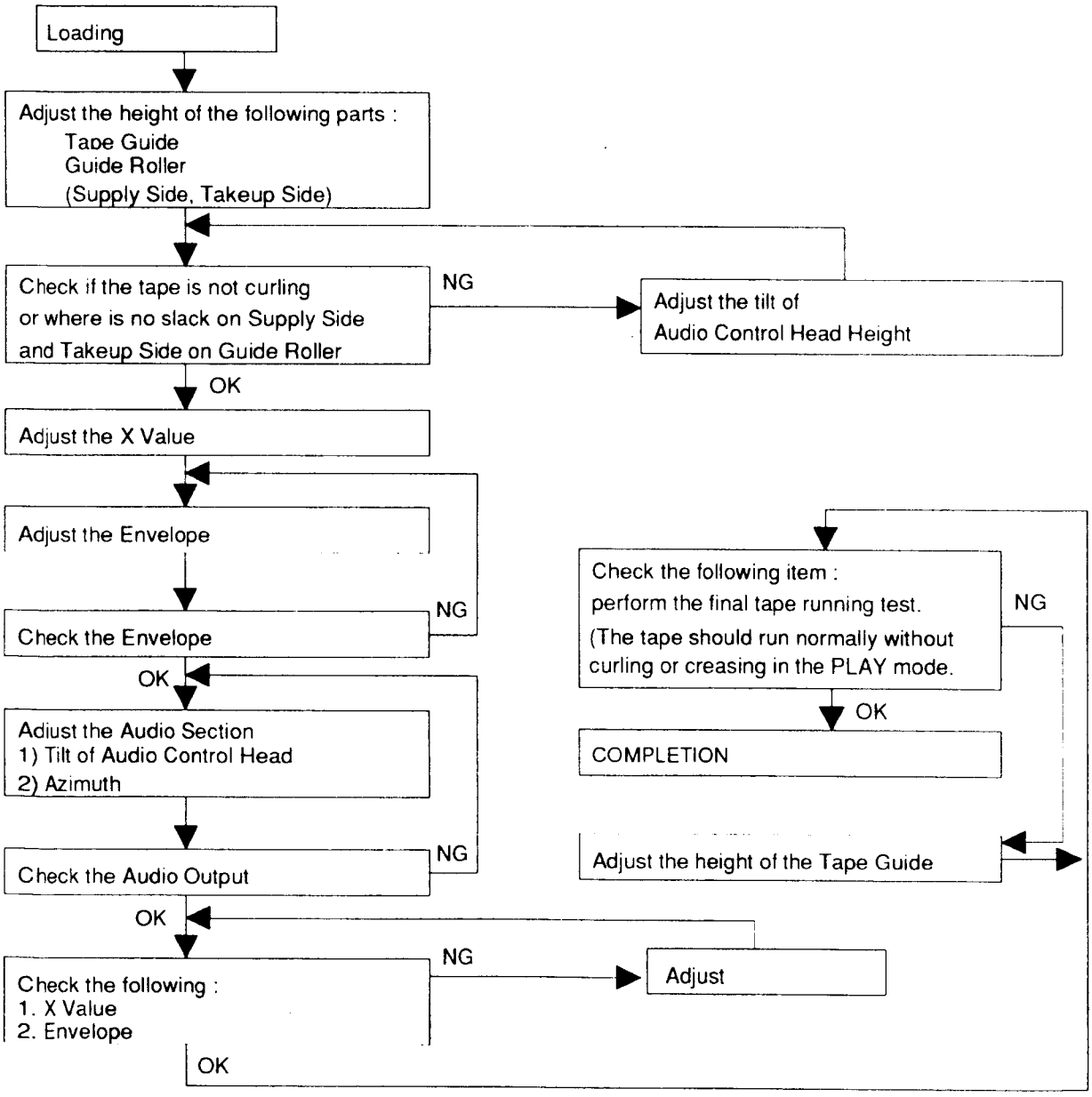
Note: To perform these alignment / confirmation procedures, make sure that the Tracking Control is set in the neutral (detent) position.

Equipment required:

Dual Trace Oscilloscope
VHS Alignment Tape{ F6-A, F6-N, F6-NS(LP model)}
Post Alignment Screwdriver
X-Position Alignment Fixture
Screwdriver (Lock the Tape Guide Rollers)
Box Driver M3

Note: After this Mechanical Alignment, perform the Electrical Adjustment method.

Tape Running Alignment Flow Chart



1-A. CONFIRMATION AND ALIGNMENT OF TAPE RUNNING

Purpose:

To make sure that the tape running is well stabilized.

Symptom of Misalignment:

If the tape runs unstable, the tape will be damaged.

1. Playback (ON FWORD) a cassette tape and confirm that the tape runs without curling or creasing at the guide rollers [2] and [3], and at the point A and B on the lead surface (Refer to Fig M3 and M4).
2. If curling or creasing is apparent, align the height of guide rollers by turning the top of guide rollers [2] and [3] with Post Adjustment Screwdriver (Refer to Fig. M3 and M4).

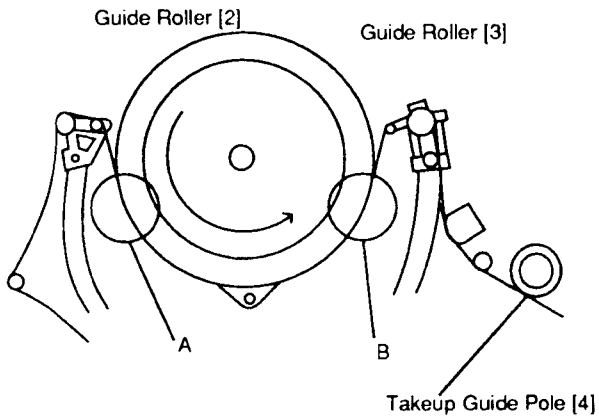


Fig. M3

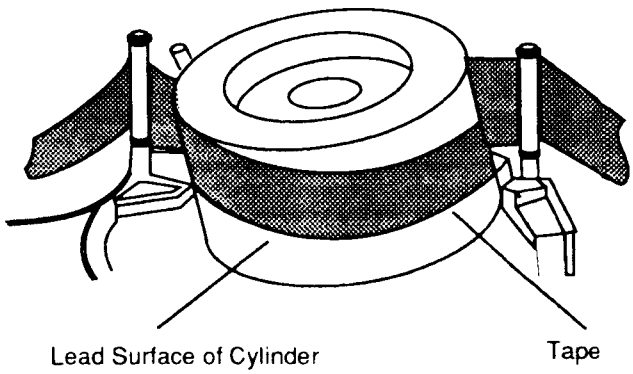


Fig. M4

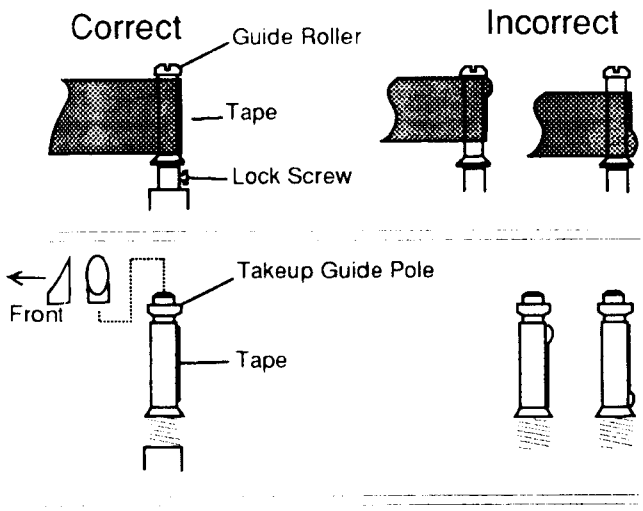


Fig. M5

1-B. CONFIRMATION OF AUDIO CONTROL HEAD HEIGHT.

Purpose:

To make sure that the tape runs properly along the Control Head.

Symptom of Misalignment:

If the control signal is not properly picked up, Servo Operation can not be achieved.

This confirmation is required when the Audio Control Head is replaced and for a preliminary height alignment. For final alignment, perform items 1-C and 1-D.

1. Playback a cassette tape. Looking at the lower edge of the Control Head with the tape in motion, ensure that the lower edge of the tape runs 0.15~0.25mm above the lower edge of the Control Head. If it does not run, turn Height Adjustment Nut [A] slightly in either direction as necessary to correct it. Turn clockwise to lower the head and counterclockwise to raise it (Refer to Fig. M7).

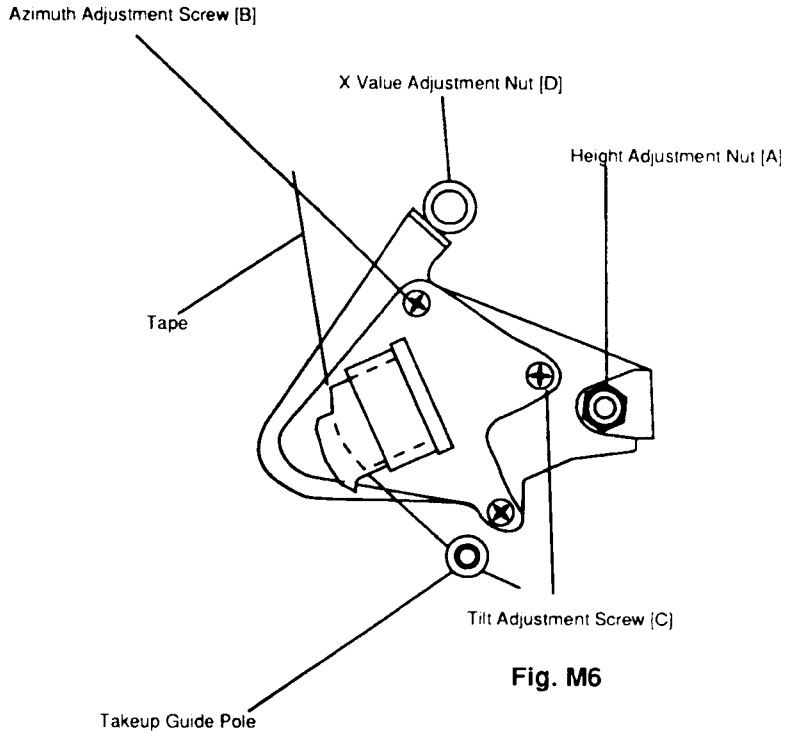


Fig. M6

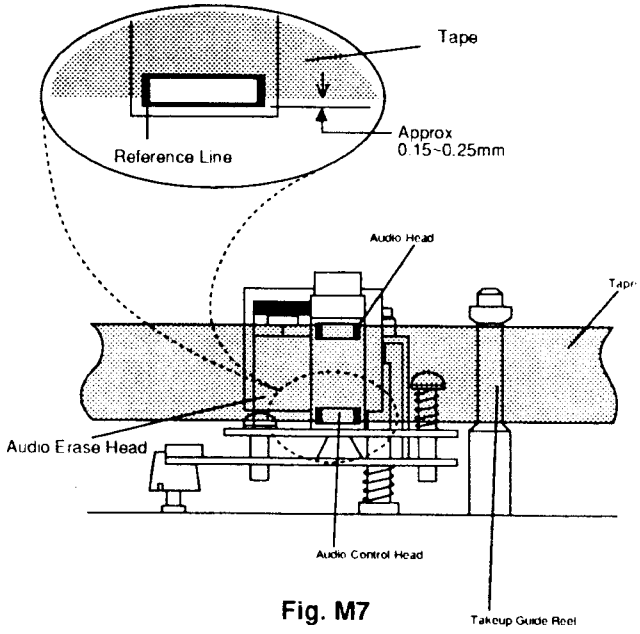


Fig. M7

1-C. CONFIRMATION OF TILT OF AUDIO CONTROL HEAD

Purpose:

To confirm that the tape running is well stabilized. In particular, confirm that tape is properly picked up the Audio Signal at the upper part and Control Signal at lower part.

Symptom of Misalignment:

If the tilt of the Audio Control Head is poorly aligned, the tape is eventually damaged.

Playback a cassette tape and confirm that the tape running between Takeup Guide Pole [4] in Fig. M3 and Audio Control Head has no slack. If tape has slack, align the Control Head by turning tilt adjustment screw in Fig. M7 so that the tape has no slack.

1-D. HEIGHT ALIGNMENT OF AUDIO CONTROL HEAD

Purpose:

To align the position and height of Audio Control Head so that it meets the tape tracks properly.

Symptom of Misalignment:

If the position of Audio Control Head is not properly aligned, the Audio S/N Ratio or Frequency Response is also poor.

1. Connect the oscilloscope to the audio output jack on the rear of deck.
2. Confirm that the Tape running condition between Takeup Guide Roller and Audio Control Head have no tape slack. If they have tape slack, remove the tape slack by turning the Tilt Adjustment screw [C]. Then realign the height of Guide Roller (Item 1-A) and X Value (Item-E).
3. Playback the Monoscope Portion (1kHz, Audio)of the alignment tape (F6-A), then confirm that the audio signal output level is 1KHz, finally adjust the Height Adjustment Nut [A] so that the output level is at maximum.
4. Adjust the Azimuth Height Adjustment Nut [B] so that the output level of AC Voltmeter Value is at maximum.

Note: Fix the screw [C] with lock paint after realignment.

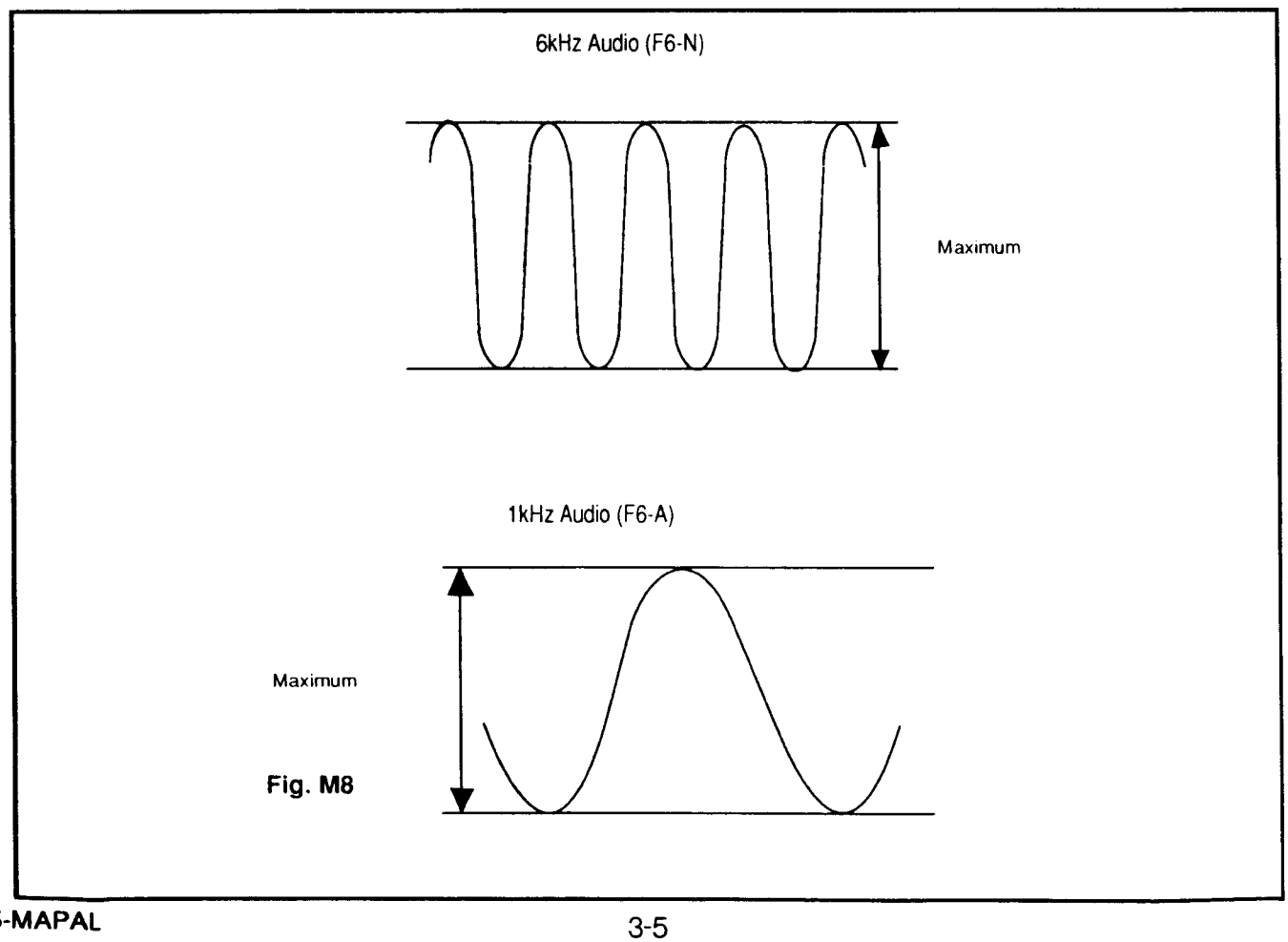


Fig. M8

Azimuth Alignment of Audio Control Head

Purpose:

To correct the Azimuth alignment so that the Control Head angle meets tape tracks properly.

Symptom of Misalignment:

If the position of Audio Control Head is not properly aligned, the Audio S/N Ratio or Frequency Response is also poor.

1. Connect the oscilloscope to the audio output jack on the rear of the deck.
2. Playback the Monoscope pattern (6kHz, audio) in the alignment tape {F6-N, F6-NS(LP model)}, then adjust the Height Adjustment Nut so that the output level of AC Voltmeter or waveform of oscilloscope is at maximum.

Note:

Fix the screw [C] with lock paint after realignment.

1-E. X VALUE ALIGNMENT

Purpose:

To align the Horizontal Position of the Audio Control Head.

Symptom of Misalignment:

If the Horizontal Position of the Audio Control Head is not properly aligned, maximum envelope can not be obtained at the Neutral Position of the Tracking Control Circuit.

1. Set the Tracking Control to the Neutral position.
2. Connect the oscilloscope to TP of C.PB on Main C.B.A. Use TP of RF-SW as a Trigger.
3. Playback the Monoscope pattern in the Alignment Tape {F6-N, F6-NS(LP model)} and confirm that the PB FM signal is output.
4. Adjust the X Value adjustment Nut so that the PB FM signal is at Maximum.

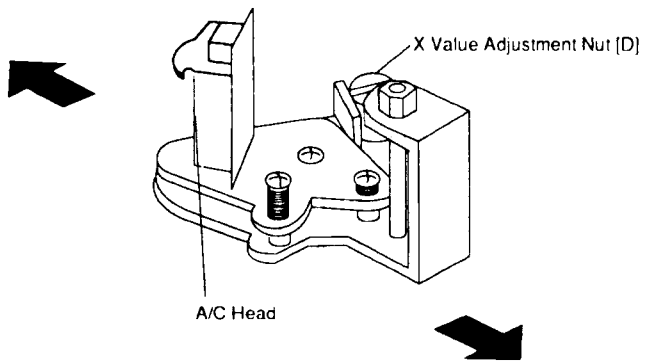


Fig. M9

1-F. CONFIRMATION/ADJUSTMENT OF ENVELOPE WAVEFORM

Purpose:

To achieve a satisfactory picture and secure precise tracking.

Symptom of Misalignment:

If the envelope output is poor, noise will appear in the picture. Then the tracking will lose precision and the playback picture will be distorted by any slight variation of the Tracking Control.

1. Set the Tracking Control to the Neutral Position.
2. Connect the oscilloscope to TP of C.PB on Main C.B.A. Use TP of RF-SW as a Trigger.
3. Playback the Monoscope pattern in the Alignment Tape {F6-N, F6-NS(LP model)}. Adjust the height of Guide Rollers [2] and [3] watching scope display so that the envelope becomes as flat as possibile ([2] and [3] refer to Fig. M3). If adjustment is required, turn the top of the Guide Roller with the Post Adjustment Screwdriver.
4. When the Scope Display is as shown in Fig. M10, adjust the height of [2] so the waveform looks like Fig. M12.

Dropping Envelope Level at the Beginning of Track.

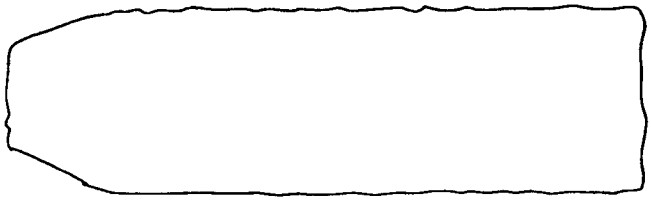


Fig. M10

5. When the Scope display is as shown in Fig. M11, adjust the height of [3] so the waveform looks like Fig. M12.

Dropping Envelope Level at the End of track.

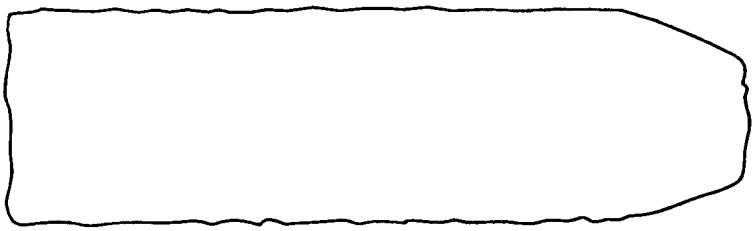


Fig. M11

6. When [2] and [3] are aligned properly, there is no Envelope Drop at the beginning and end of track as shown in Fig. M12.

Envelope is adjusted properly (No Envelope Drop)

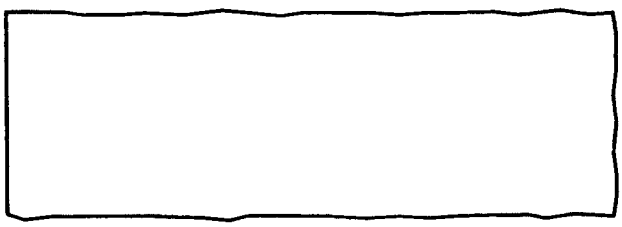


Fig. M12

Note:

After alignment, confirm the X VALUE by pushing the Tracking Control Up or Down buttons alternately, to check the symmetry of the envelope. If required, perform "X VALUE ALIGNMENT".

DISASSEMBLY/ASSEMBLY PROCEDURES OF DECK MECHANISM

MAIN MECHANISM

This procedures starts with the condition that the Cabinet Parts, Cassette Up Unit and Head Amp C.B.A. have been removed. Also, all the following procedures for adjustment and parts replacement should be performed in Stop mode. When reassembling, perform the steps in the reverse order.

STEP /LOC. NO	START -ING NO.	PART		REMOVAL		INSTALLATION
				FIG. NO	REMOVE*UNHOOK/UN-LOCK/RELEASE/UN-PLUG/DESOLDER	ADJUSTMENT CONDI-TION
[1]	1	TENSION LEVER SUB ASS'Y	T	DM1 DM3	*(P-1),*(L-1)	(+)
[2]	2	BAND BRAKE SUB ASS'Y	T	DM1 DM3	(S-1)	
[3]	3	MODE CHANGE LEVER	T	DM1 DM4	*2(L-2)	
[4]	3	M BRAKE (S)	T	DM1 DM5	*(P-2)	(+) When reassembling, hook the Spring after in-stallation of Mode Change Lever
[5]	3	M BRAKE (S) LEVER	T	DM1 DM5		
[6]	3	S BRAKE ARM	T	DM1 DM5	*(P-3)	When reassembling, hook the Spring after in-stallation of Mode Change Lever
[7]	3	M BRAKE (T) Ass'y	T	DM1 DM5		
[8]	3	T BRAKE ARM Ass'y	T	DM1 DM5	*(P-4)	When reassembling, hook the Spring after in-stallation of Mode Change Lever
[9]	3	REEL BASE ASS'Y	T	DM1 DM6	Poly Slider Washer	(+)
[10]	10	MOTOR HOLDER CALKING ASS'Y	T	DM1 DM7	3(S-2)	(+)
[11]	11	LDG MOTOR PREPARATION	T	DM1 DM7	2(S-3), BELT	(+)
[12]	10	CASSETTE DRIVE LEVER ASS'Y	T	DM1 DM7	2(S-3)	(+)
[13]	10	PINCH ROLLER ARM ASS'Y	T	DM1 DM7	(C-1), Pinch Roller Spring	(+)
[14]	10	PINCH ARM ASS'Y	T	DM1 DM7		(+)
[15]	10	CAM	T	DM1 DM7		(+)
[16]	10	MAIN LEVER ASS'Y	T	DM1 DM8	*(L-3) Main Lever Spring	
[17]	17	TAPE GUIDE ASS'Y	T	DM1 DM8	*(P-5), *(L-4)	
[18]	11	PULLEY ASS'Y	T	DM1 DM9	*(L-5) LDG BELT	
[19]	19	A/C HEAD ASS'Y	T	DM1 DM8	Nylon Nut, Adjust Nut, Head Height Adjustment Spring	
[20]	20	EARTH BLUSH ASS'Y	T	DM2 DM10	(S-4)	When reassembling, confirm the brush is at center of post.
[21]	21	CYLINDER DRUM ASS'Y	T	DM1 DM10	3(S-5), 3(S-6) Connec-tor	
[22]	22	CLUTCH BLOCK ASS'Y	T	DM1 DM11	2(S-7)	
[23]	23	HEAD AMP PCB	T	DM2 DM12	(S-9), FFC cable	For connecting, Refer to connectors Points.
[24]	24	CAPSTAN MOTOR UNIT	B	DM2 DM12	3(S-10), (C-2)	
[25]	24	LOADING ARM M ASS'Y	B	DM2 DM15	(C-3)	When installing, match the marks.
● [26]	26	REC ARM (REC/PLAY MODEL ONLY)	B	DM2 DM13	(P-6)	
[27]	26	BT DRIVE ARM	B	DM2 DM13	(S-11), (P-7)	
[28]	20	MOVING GUIDE S ASS'Y	T	DM1 DM14	(C-4)	(+)

STEP /LOC. NO	START -ING NO.	PART		REMOVAL		INSTALLATION
				FIG. NO	REMOVE*UNHOOK/UN-LOCK/RELEASE/UN-PLUG/DESOLDER	ADJUSTMENT CONDI-TION
[29]	20	MOVING GUIDE T ASS'Y	T	DM1 DM14	(C-5)	(+)
[30]	20	LOADING GEAR B	B	DM2 DM15	(P-8)	(+)
[31]	20	LOADING GEAR A	B	DM2 DM15	(P-9)	(+)
[32]	20	FE HEAD	B	DM2 DM14	(S-12)	(+)
[33]	20	LUMINESCENCE PRISM	B	DM2 DM14	(S-13)	(+)
[34]	35	M LEVER STOPPER A ASS'Y	T	DM2 DM12	(C-3)	(+)
[35]	34	M LEVER STOPPER B ASS'Y	B	DM2 DM12	(C-3)	(+)
[36]	36	KICK ARM	B	DM2 DM12	(C-4)	(+)
[37]	37	MODE SW	B	DM2 DM12	(L-5), FFC CABLE	For Connecting, Refer to Connectors Points.
[38]	38	JOINT PCB	T	DM1 DM12	(S-8), FFC CABLE	For Connecting, Refer to Connectors Points.
☆[39]	39	DEW SENSOR	B	DM2 DM12	(S-14)	(+)
✱[40]	40		B	DM2 DM12	B-87 F Break Spring	(+)

① ② ③ ④ ⑤ ⑥ ⑦

Note :

1. Order of steps in Procedure. When reassembling, perform the step(s) in the reverse order.
   These number are also used as the identification (Location) No. of parts in Figures.
2. Starting No. followed by corresponding part which any other parts. But M Brake S can be removed without after removing Mode Change Lever (No. 1).
3. Parts to be removed or installed.
4. Location of part T=Top B=Bottom R=Right L=Left
5. Fig. No Showing Procedure or Part Location.
6. Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped or desoldered.
   P=Spring W=Washer C=Cut Washer S=Screw *=Unhook, Unlock unrelease unplug desolder
   2 (C-2) = 2 Cut Washer (C-2) 2(L-2)=2Locking Clips(L-2)
7. Adjustment information for installation (+)
   Refer to Deck Exploded Views for lubrication information.

● [26] ------- Rec / Play model only
☆[39] -------- With DEW Sensor Model only
✱ [40] -------- 4 head model only

TOP VIEW

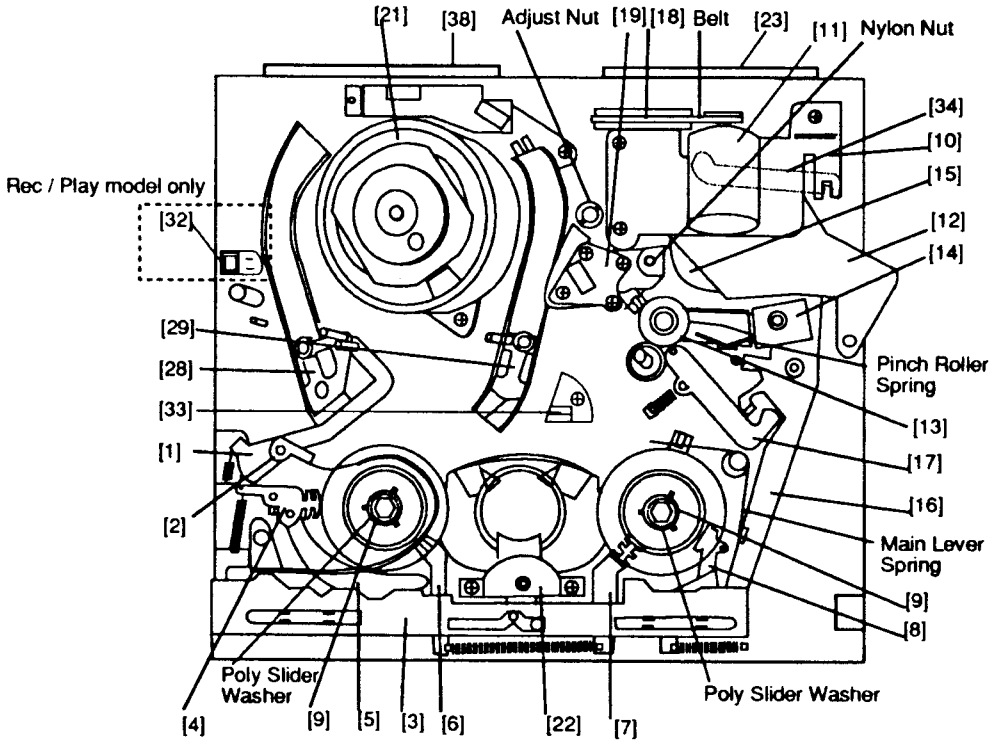


Fig. DM1

* [39] Dew Sensor - With Dew Sensor model only

BOTTOM VIEW

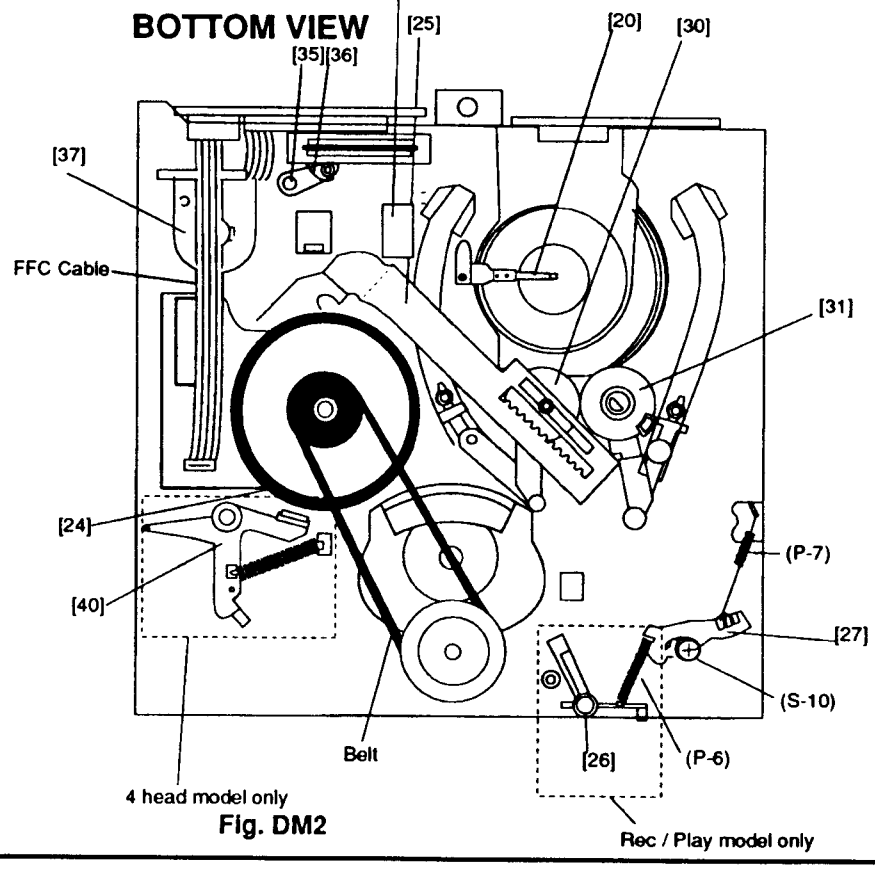


Fig. DM2

DECK CONNECTORS

NOTE: Disconnect Connectors shown below befor Disassembling the DECK

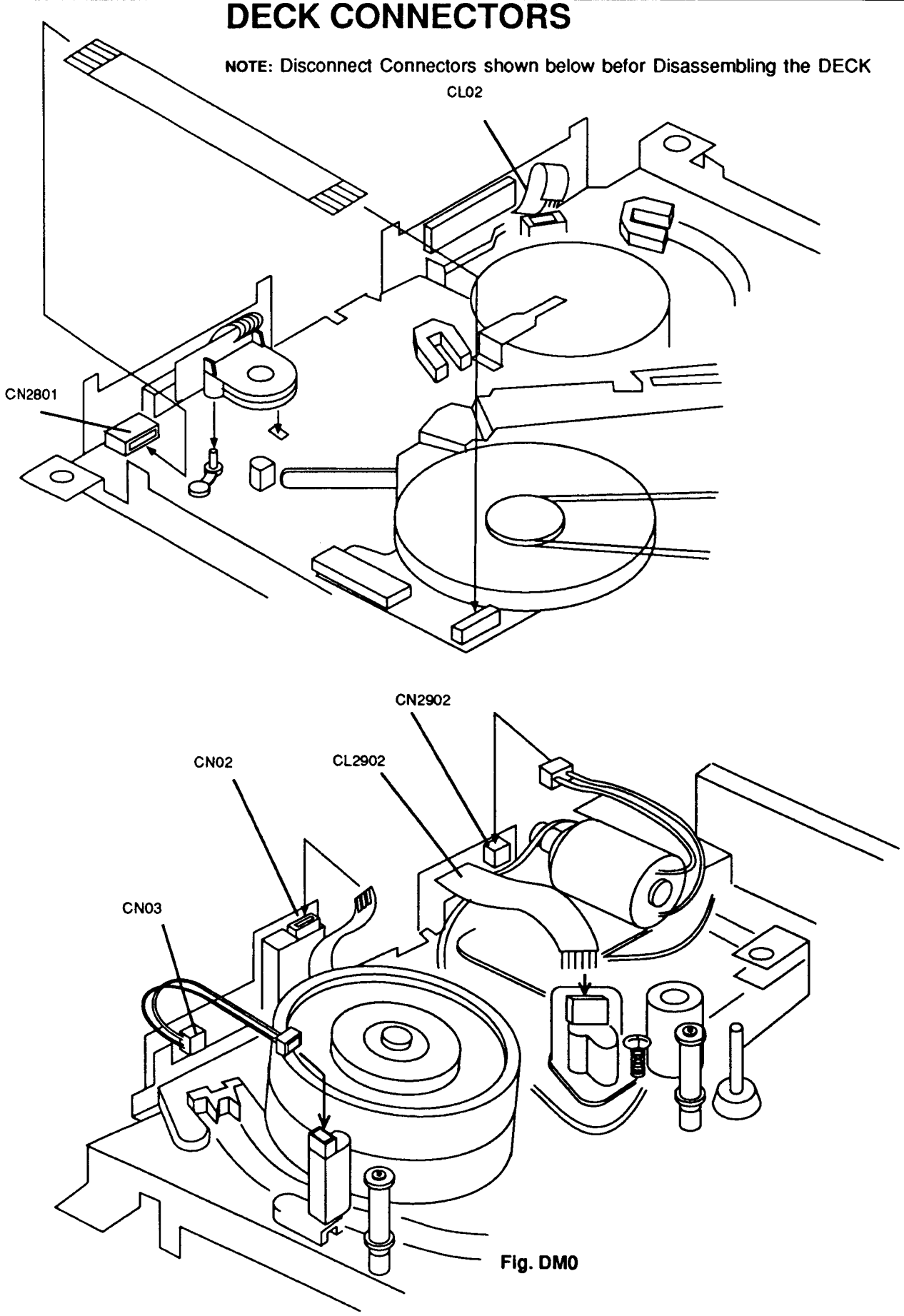


Fig. DM0

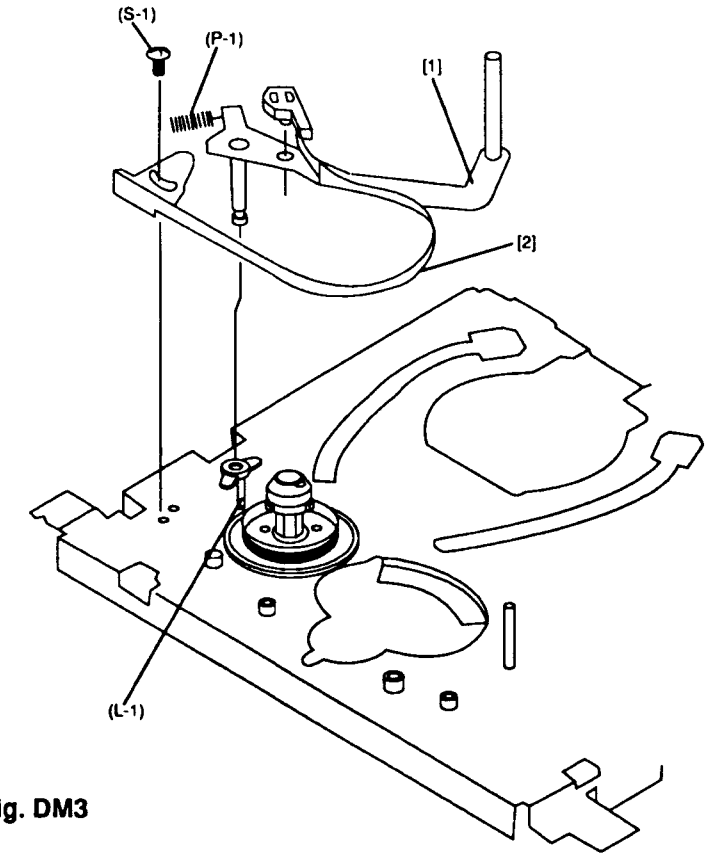


Fig. DM3

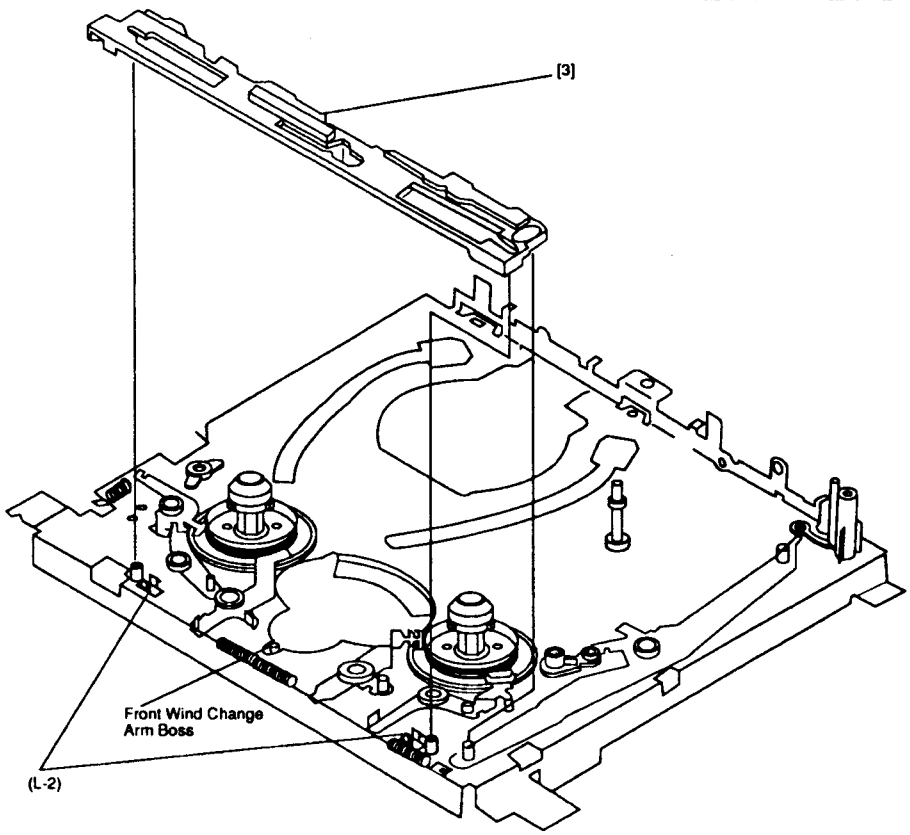


Fig. DM4

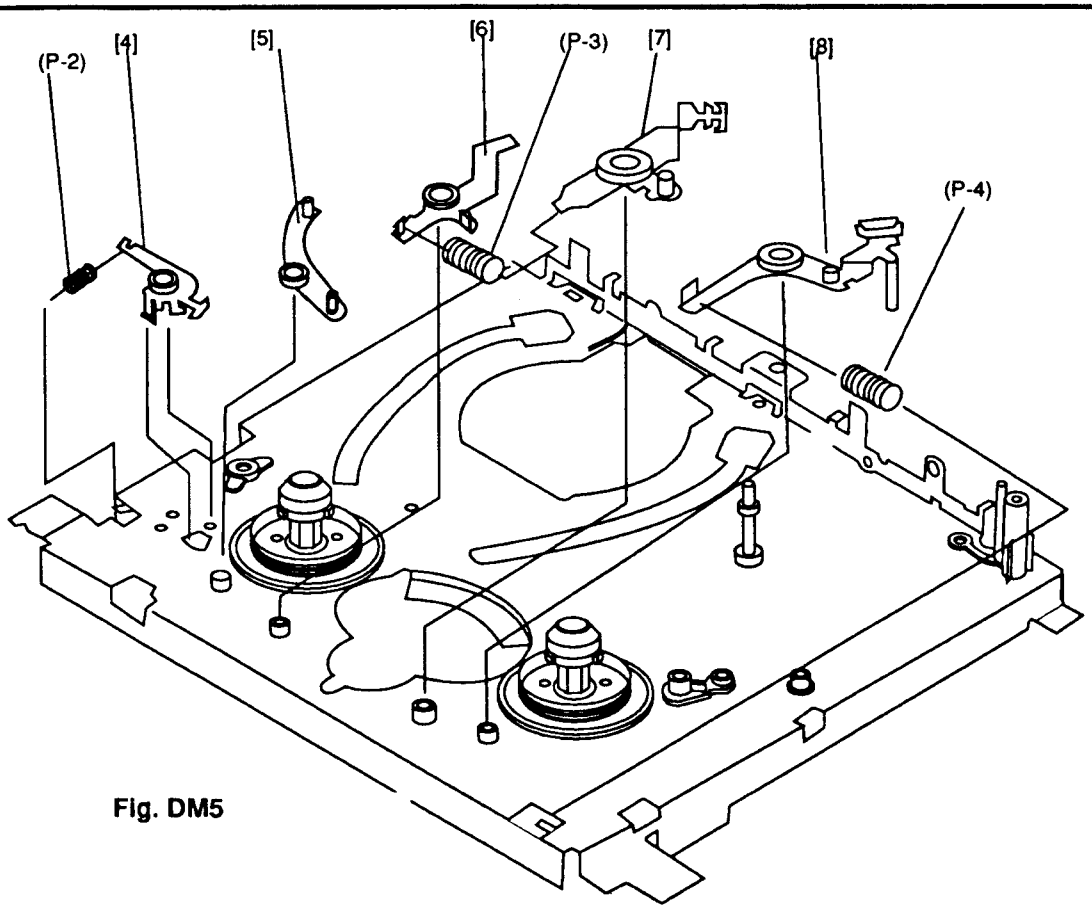


Fig. DM5

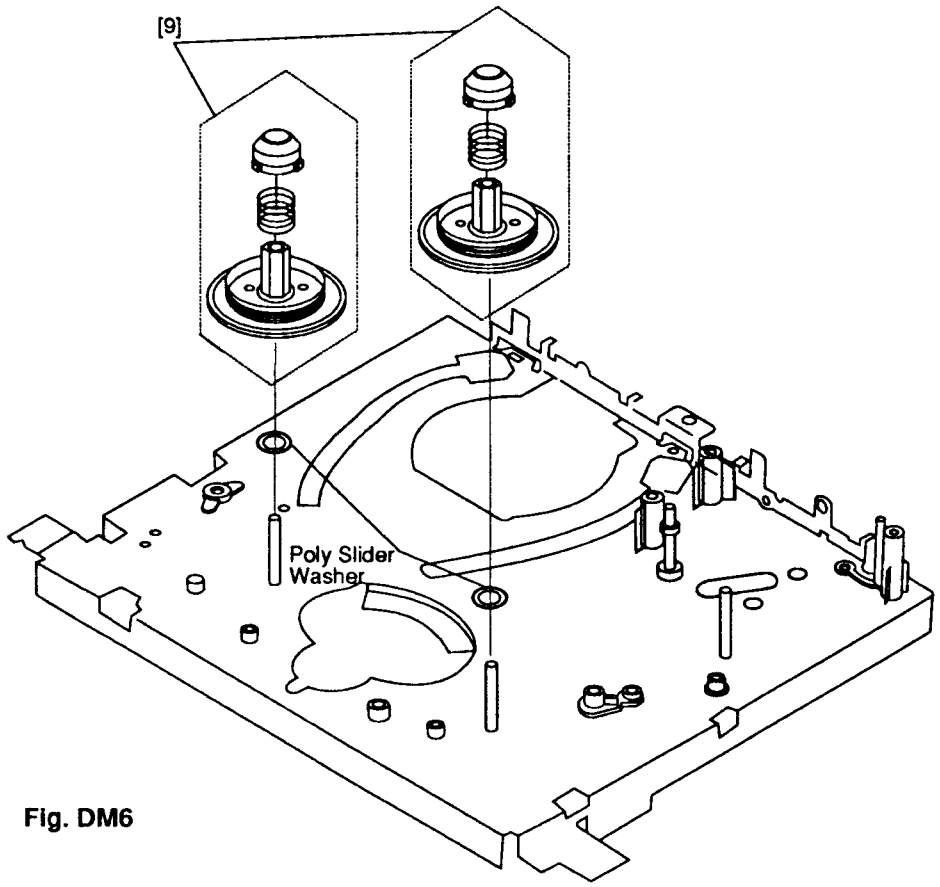


Fig. DM6

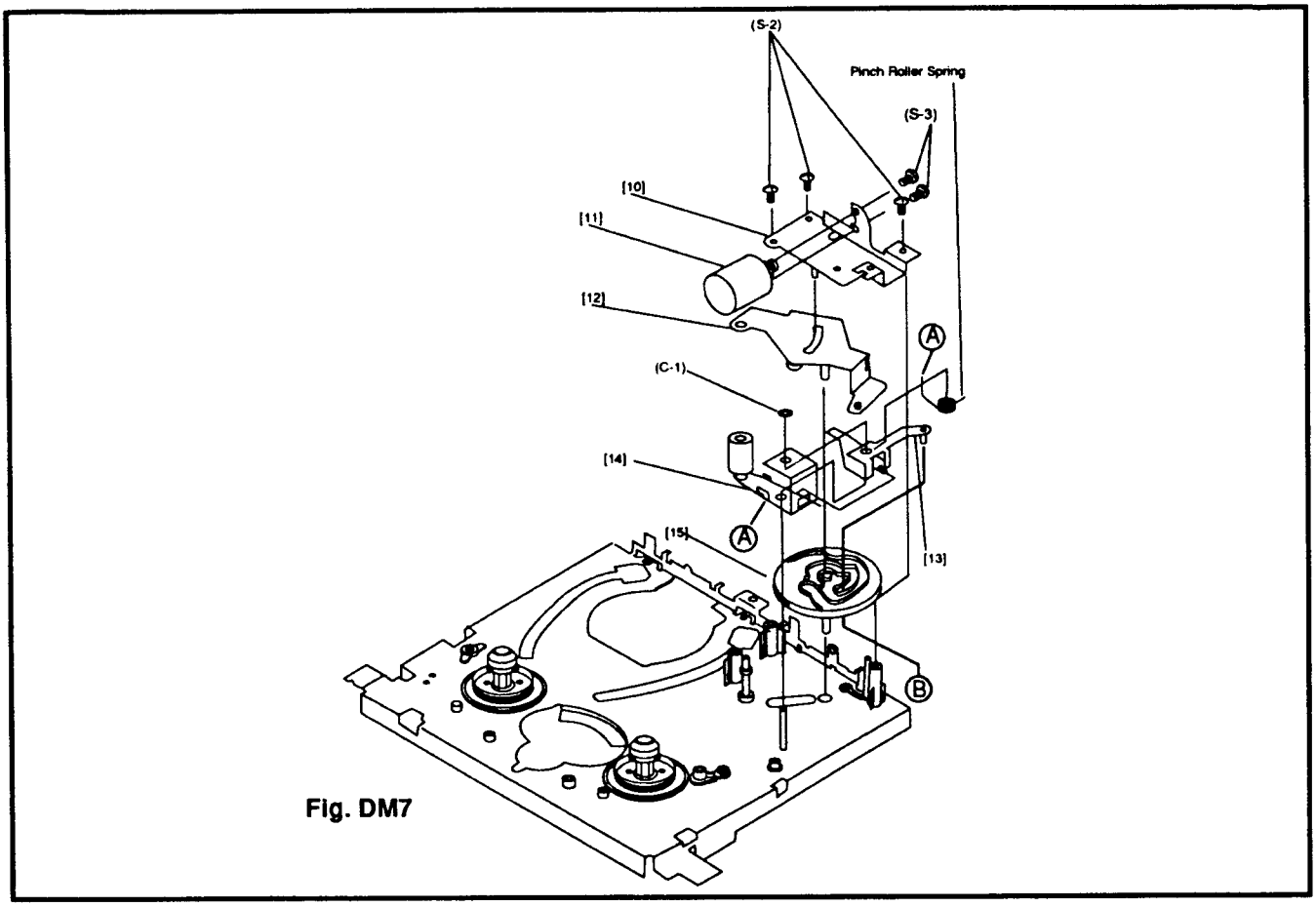


Fig. DM7

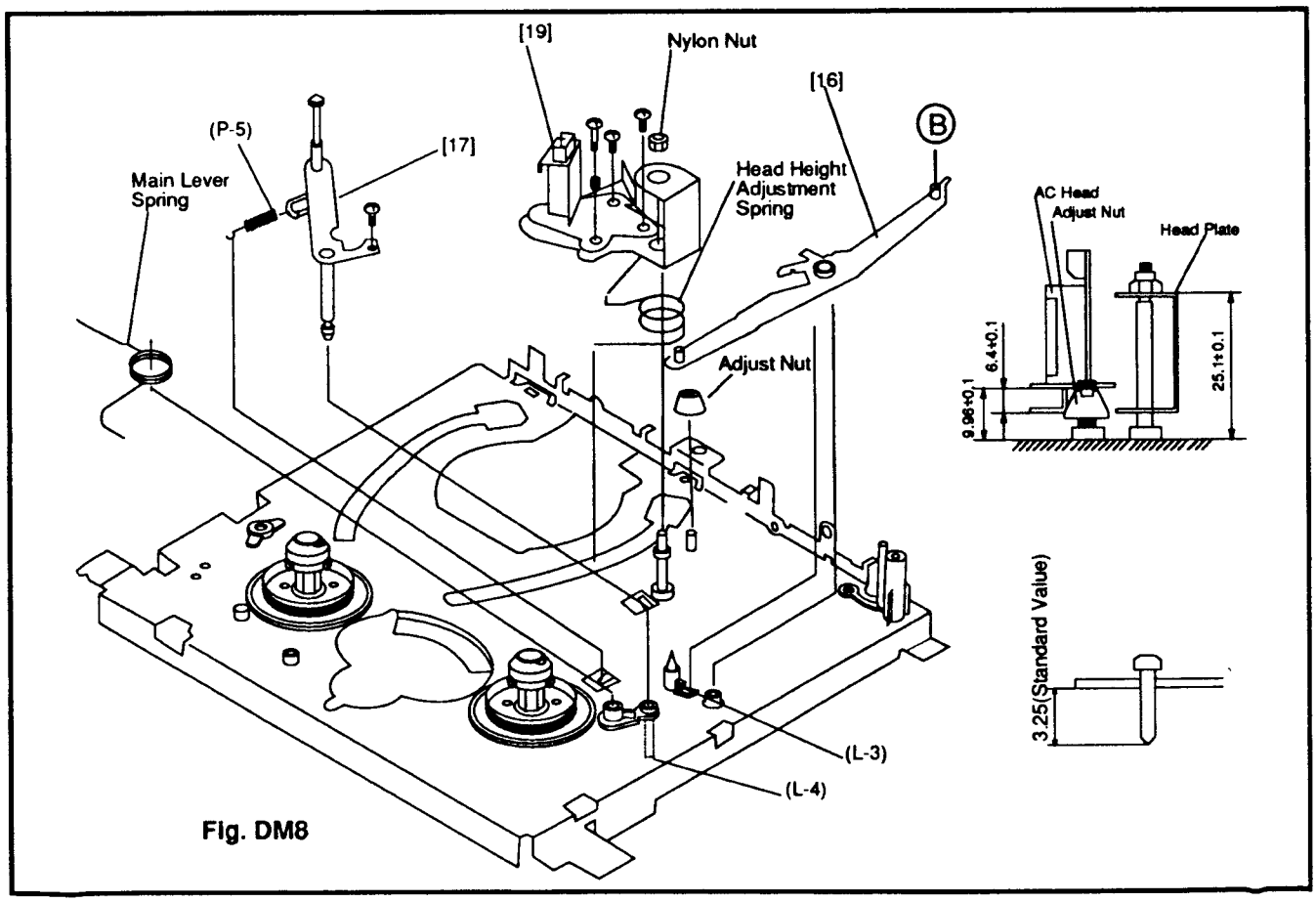


Fig. DM8

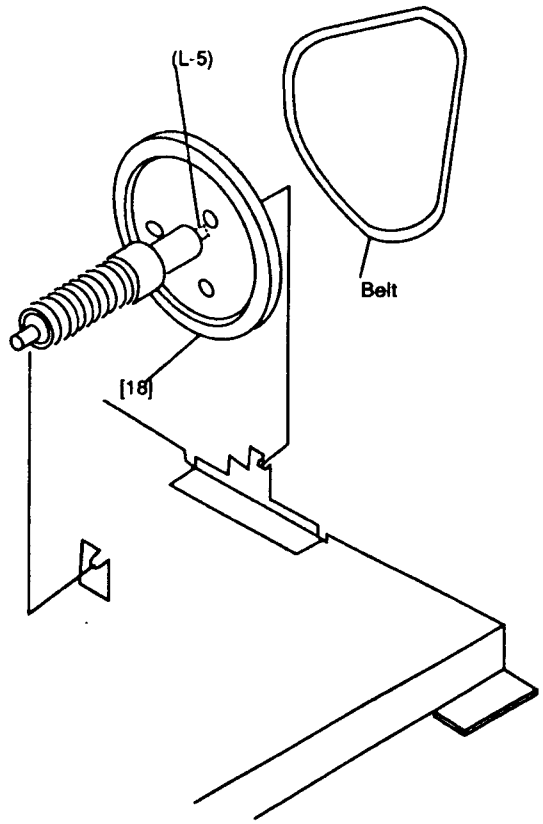


Fig. DM9

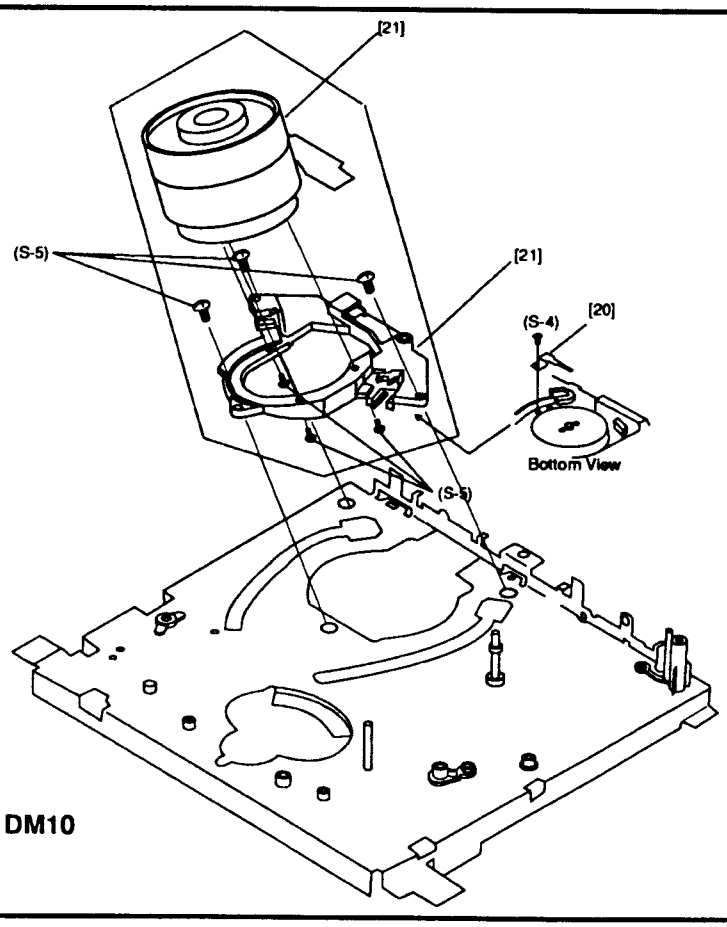


Fig. DM10

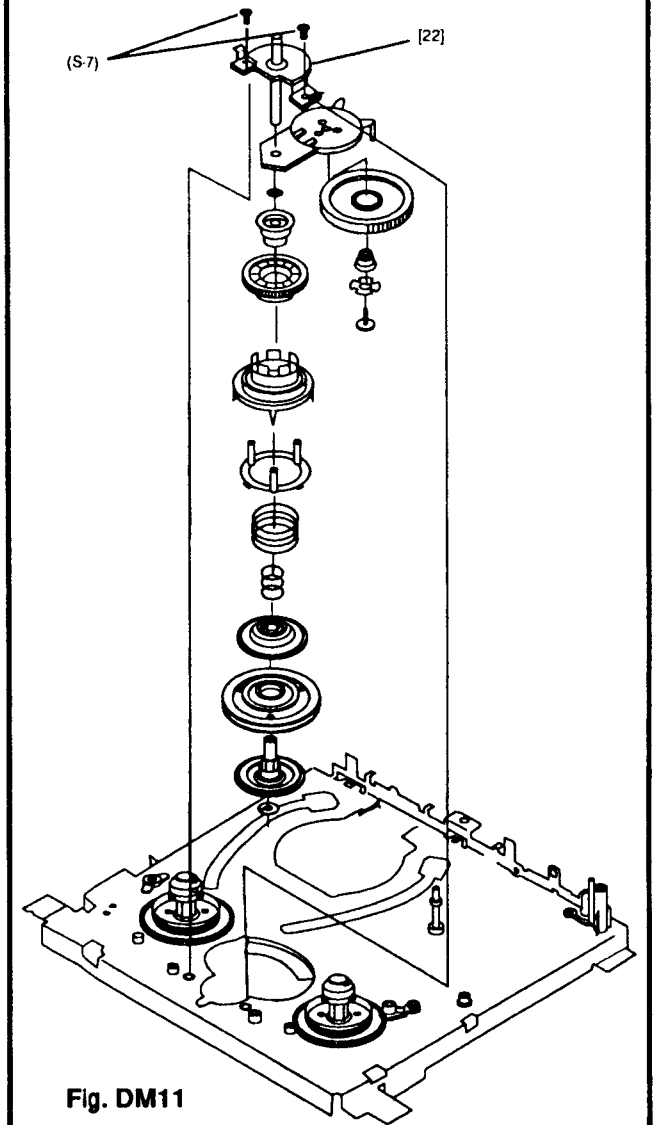


Fig. DM11

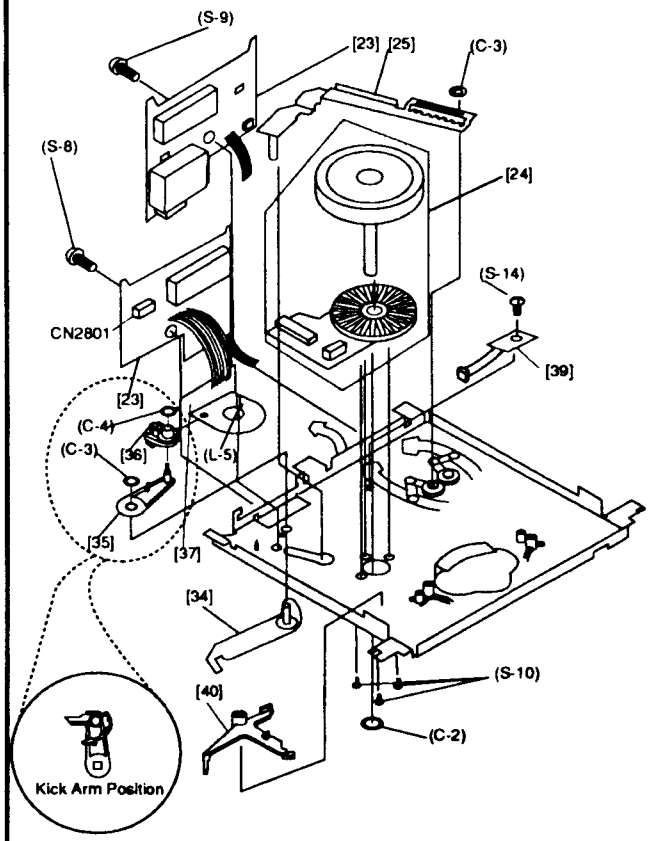


Fig. DM12

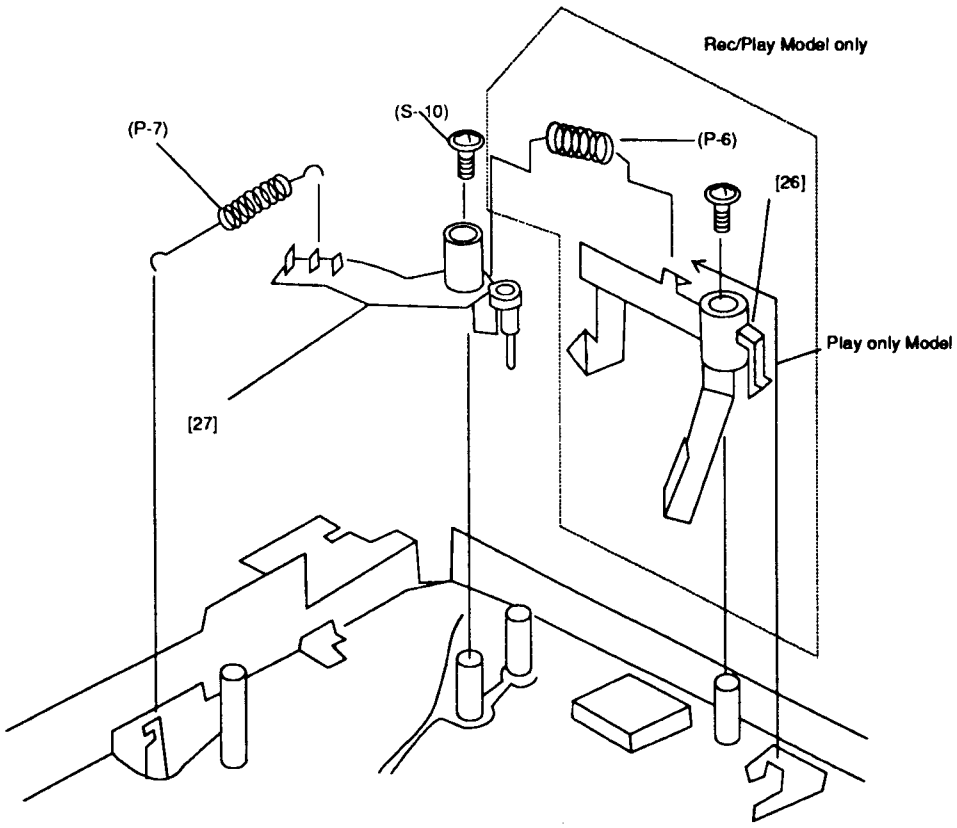
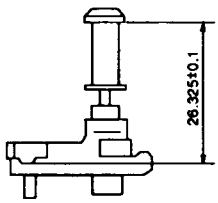


Fig. DM13



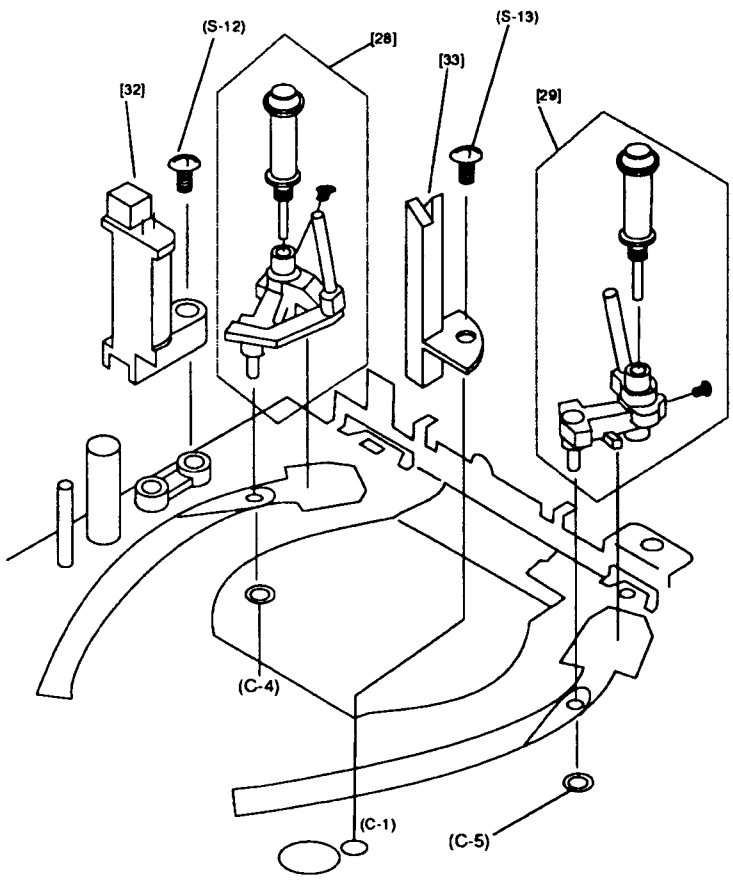


Fig. DM14

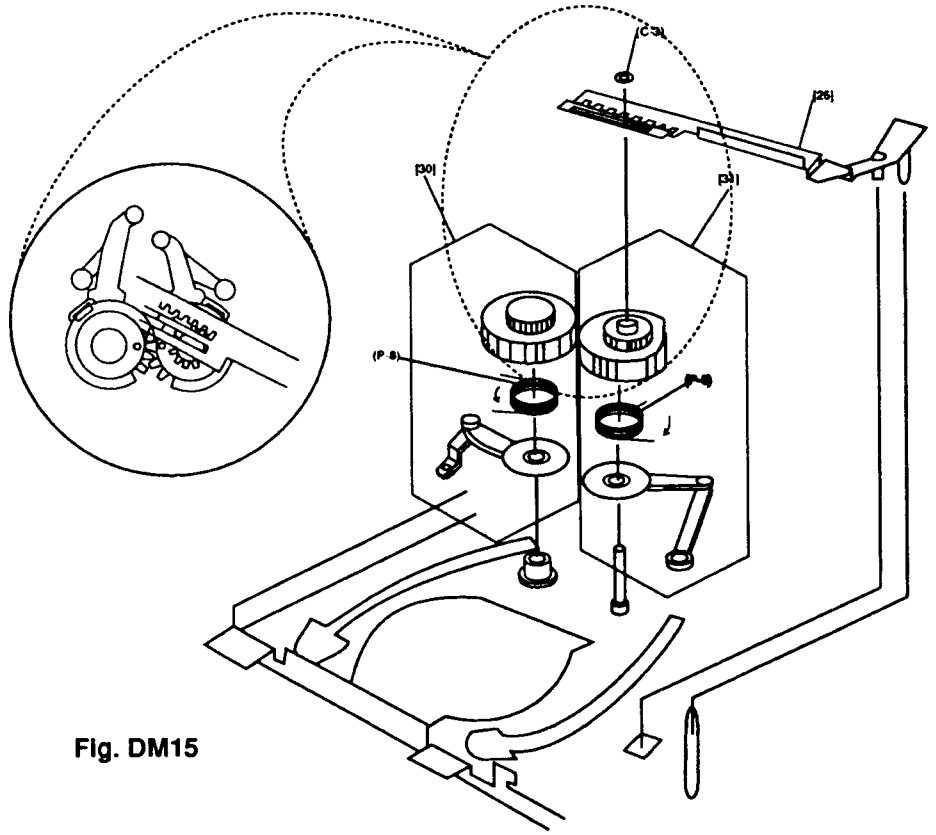
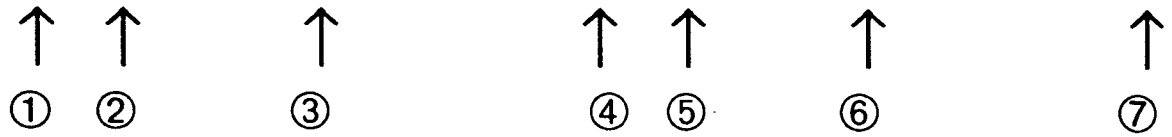


Fig. DM15

CASSETTE UP UNIT

This procedure starts with the condition that the Cassette Up Unit has removed from chassis. When reassembling, perform the step(s) in the reverse order.

STEP /LOC. NO	START -ING NO.	PART		REMOVAL		INSTALLATION
				FIG. NO	REMOVE*UNHOOK/UNLOCK/RELEASE/UNPLUG/DESOLDER	ADJUSTMENT CONDITION
[1]	1	DRIVING GEAR REINFORCEMENT	R	DM16	(S-1)	
[2]	1	CASSETTE DRIVE GEAR (R)	R	DM16	*(L-1) Cassette Drive Gear Spring(R)	Refer to setting Condition in Fig. DA16.
[3]	1	RACK ASS'Y	R	DM16	*(L-2)	
[4]	3	DOOR OPENER	R	DM16	Door Opener Spring	When installing the Door Opener Spring, refer to setting Condition in Fig. DM16.
[5]	4	CASSETTE DRIVE GEAR L	(L)	DM17	Cassette Drive Gear Spring(L), *(L-3)	
[6]	4	INTERLOCKING GEAR (L)	L		*(L-4)	
[7]	4	FRONT DOOR OPENER	L	DM17	Front Door Spring	When installing, refer to the setting Condition in Fig. DM17.
[8]	7	CASSETTE HOLDER PLATE	T	DM18	*2(L-5)	
[9]	9	PRISM R	R	DM16	*(L-6)	
[10]	10	PRISM L	L	DM17	*(L-7)	



Note:

1. Order of steps in Procedure
   When reassembling, perform the step(s) in the reverse order.
   These number are also used as the identification (Location) No. of parts in Figures.
2. Starting No. followed by corresponding part which any other parts. But M Brake S can be removed without after removing Mode change Lever (No. 1).
3. Parts to be removed or installed.
4. Location of part T=Top B=Bottom R=Right L=Left
5. Fig. No Showing Procedure or Part Location.
6. Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped or desoldered.
   P=Spring W=Washer C=Cut Washer S=Screw *=Unhook, unlock unrelease unplug desolder
   2 (C-2) = 2 Cut Washer (C-2)
7. Adjustment information for installation (+)
   Refer to Deck Exploded Views for lubrication information.

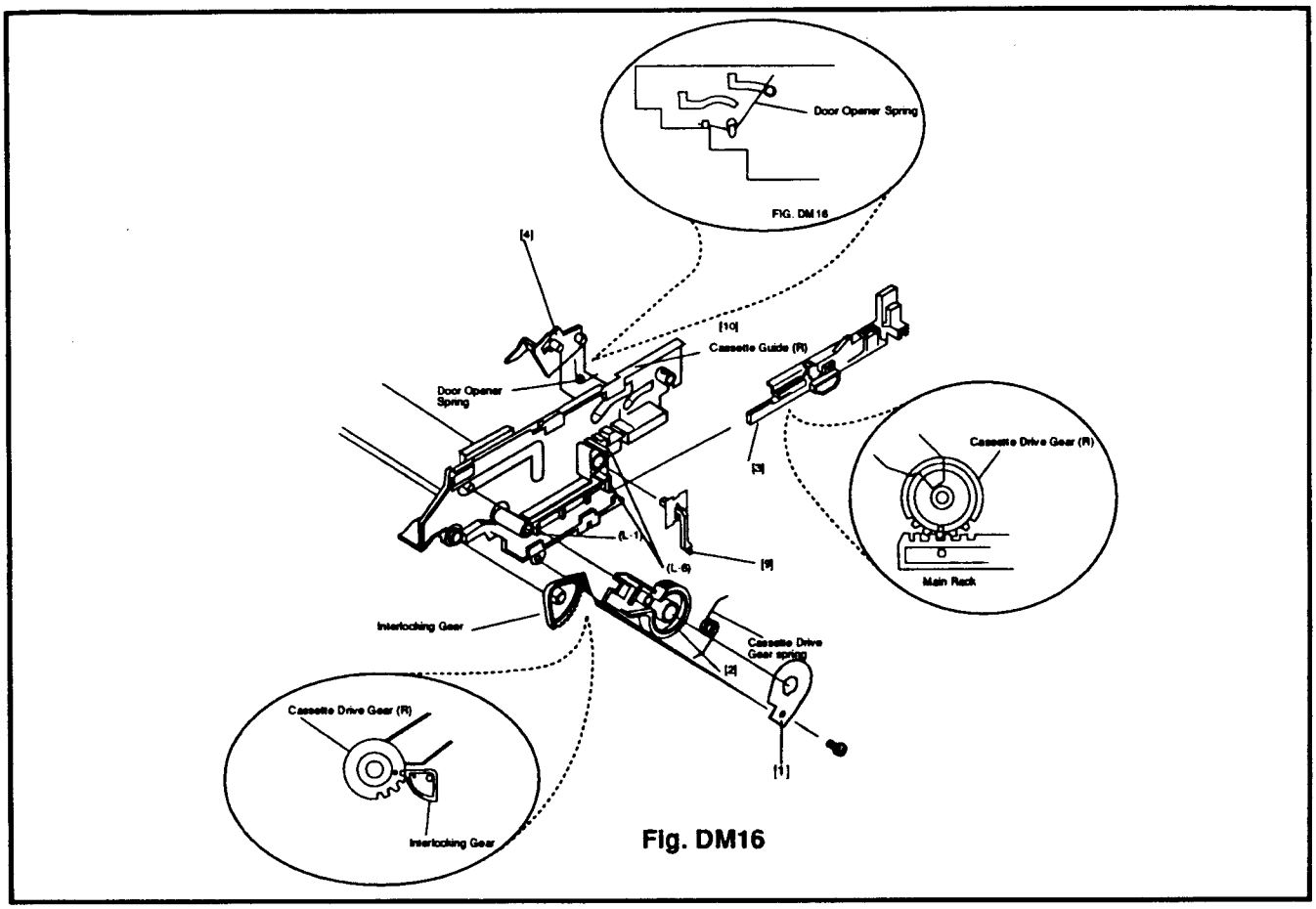


Fig. DM16

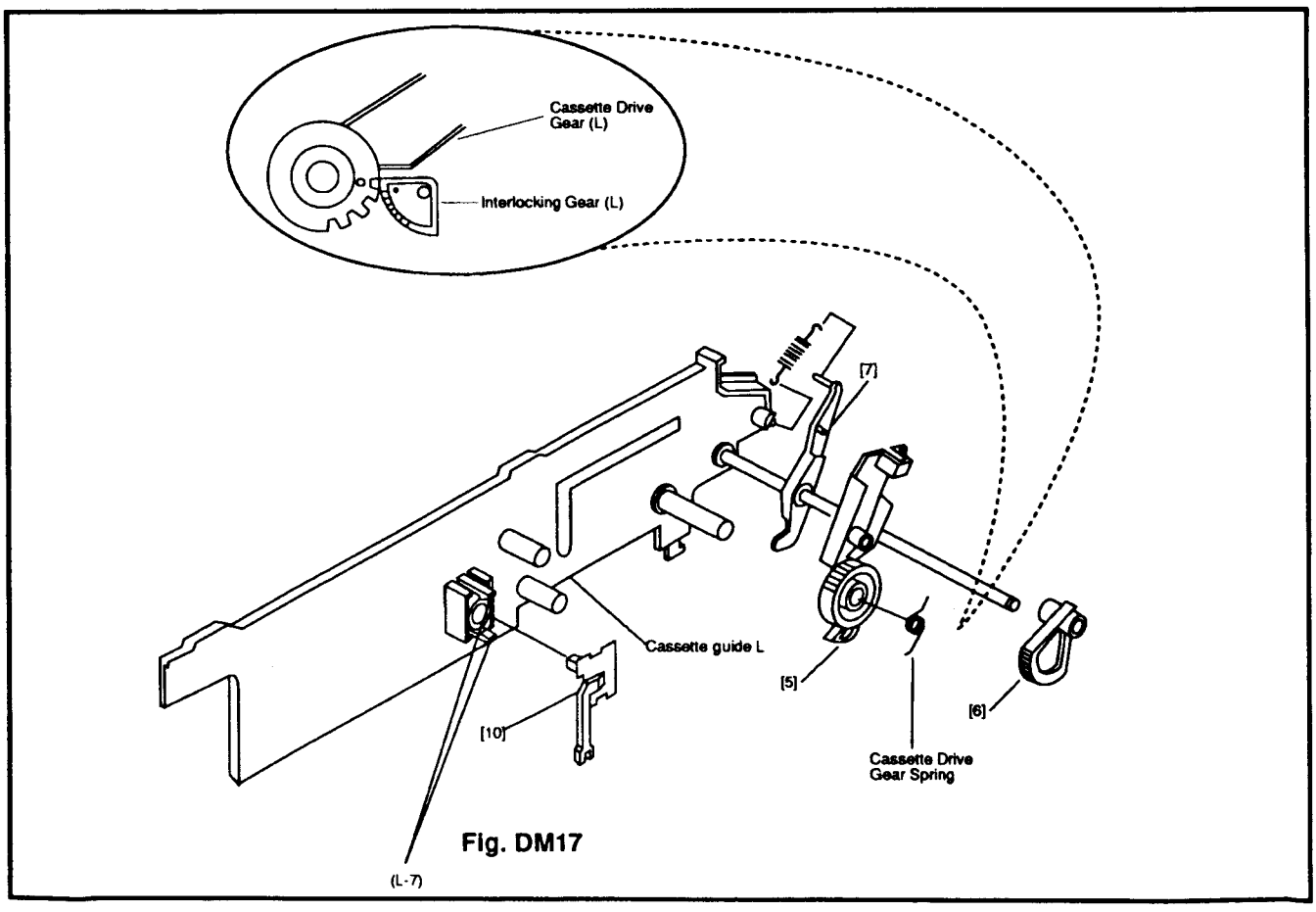


Fig. DM17

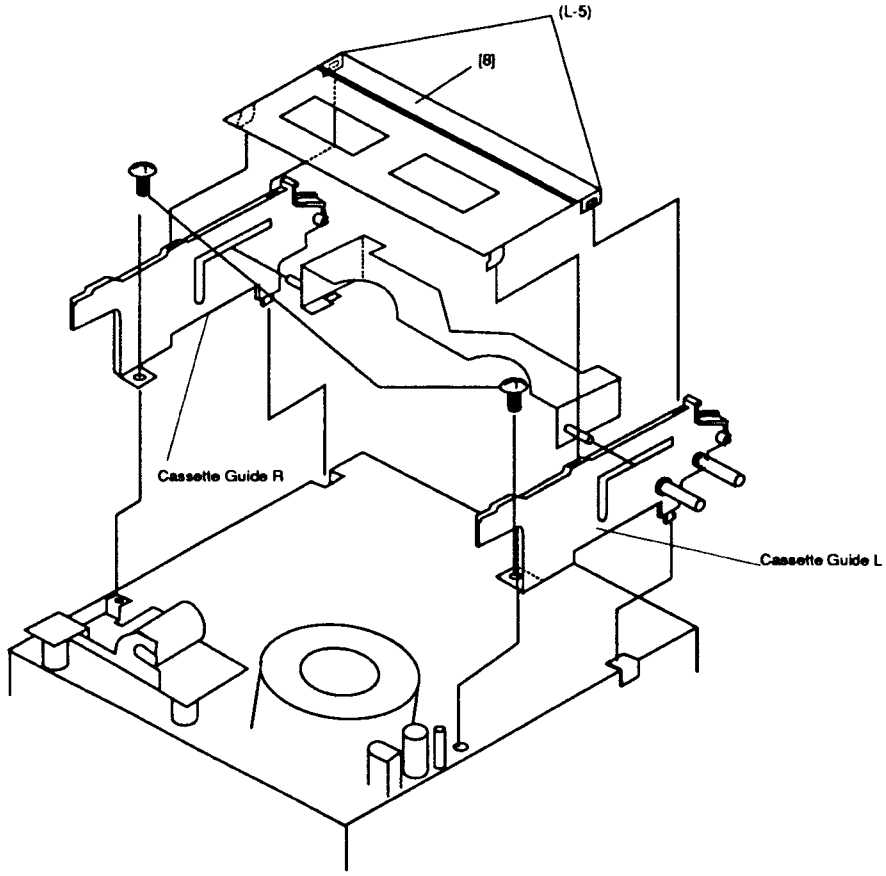
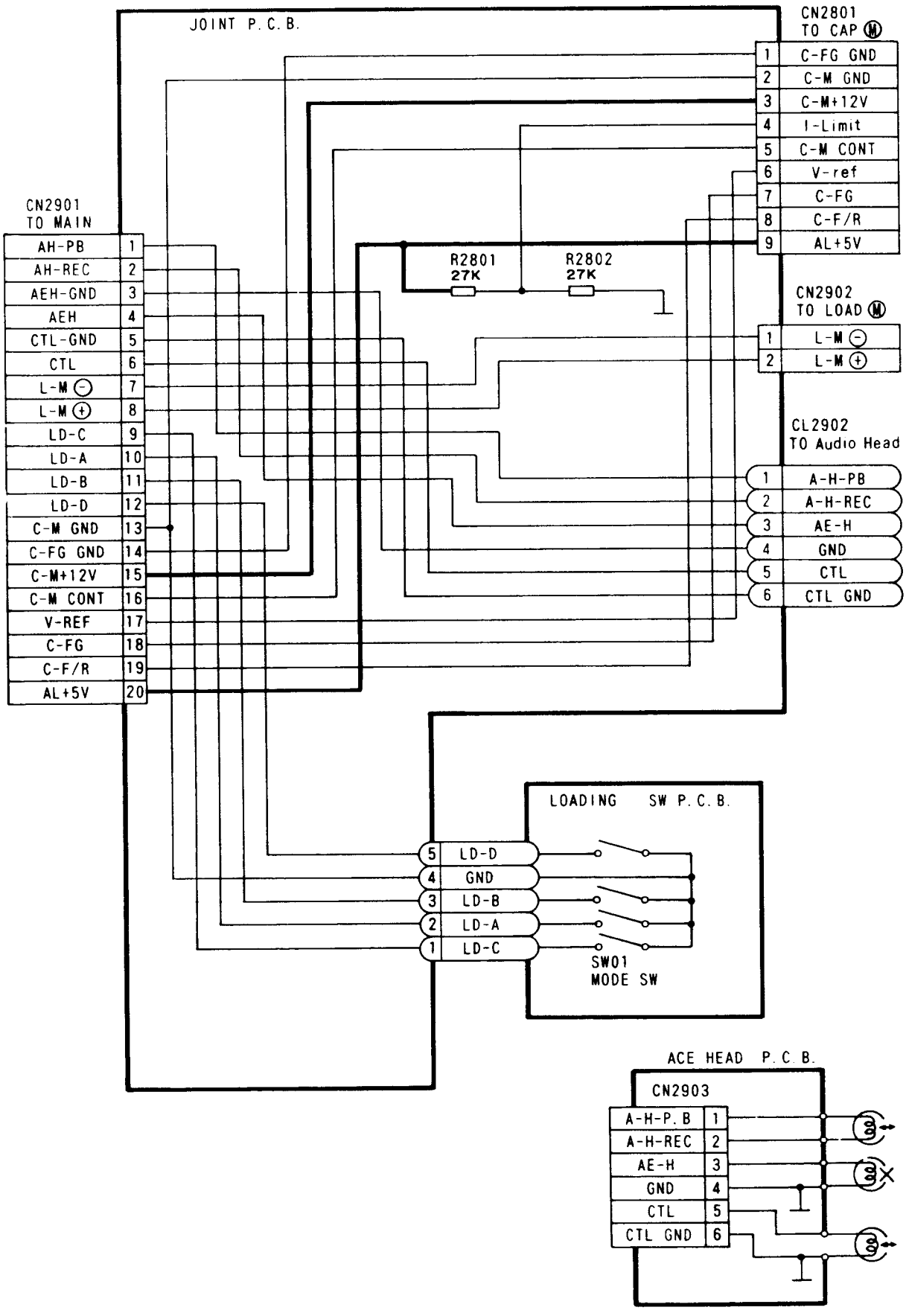


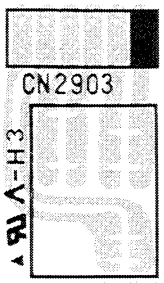
Fig. DM18

DECK SCHEMATIC DIAGRAM

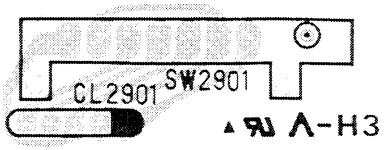


DECK C.B.A.

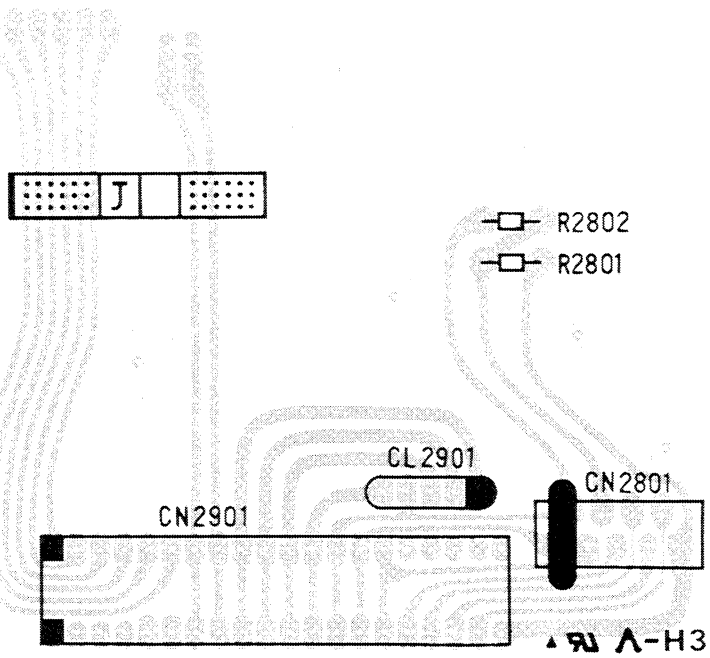
ACE HEAD C.B.A.



MODE SW C.B.A.



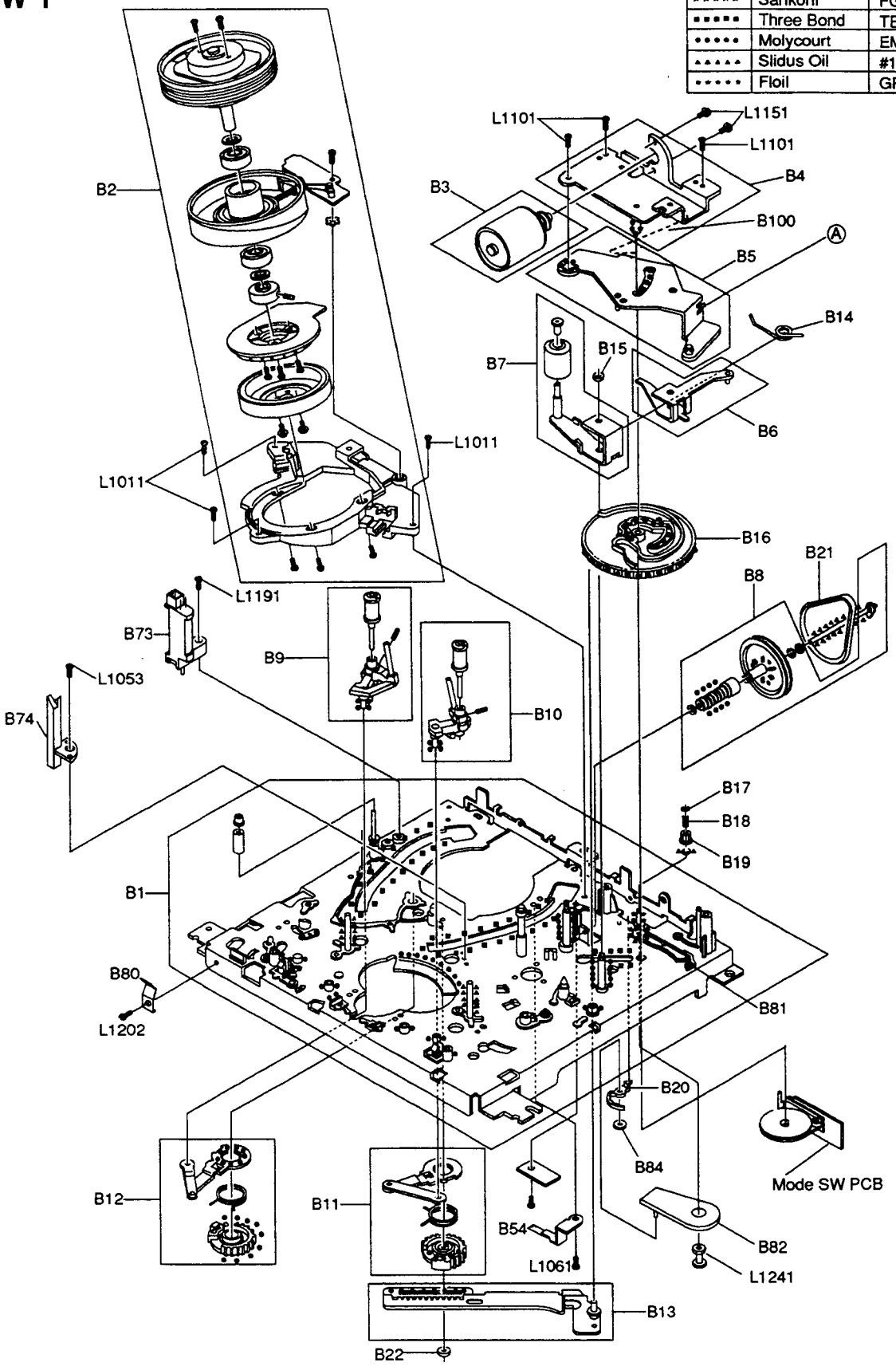
JOINT C.B.A.



DECK EXPLODED VIEWS

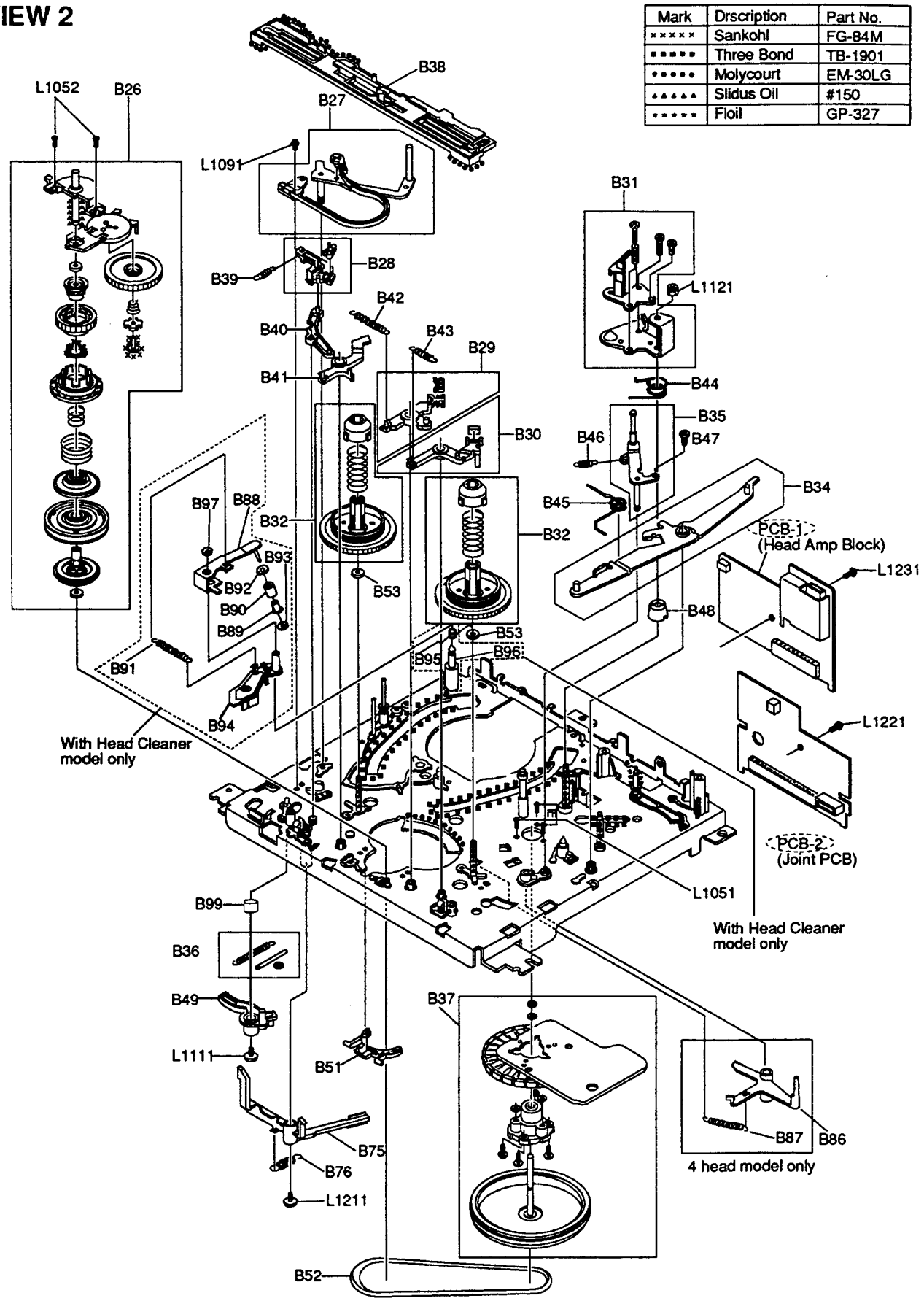
VIEW 1

Mark	Drscription	Part No.
×××××	Sankohl	FG-84M
■■■■■	Three Bond	TB-1901
●●●●●	Molycourt	EM-30LG
▲▲▲▲▲	Slidus Oil	#150
●●●●●	Floil	GP-327



VIEW 2

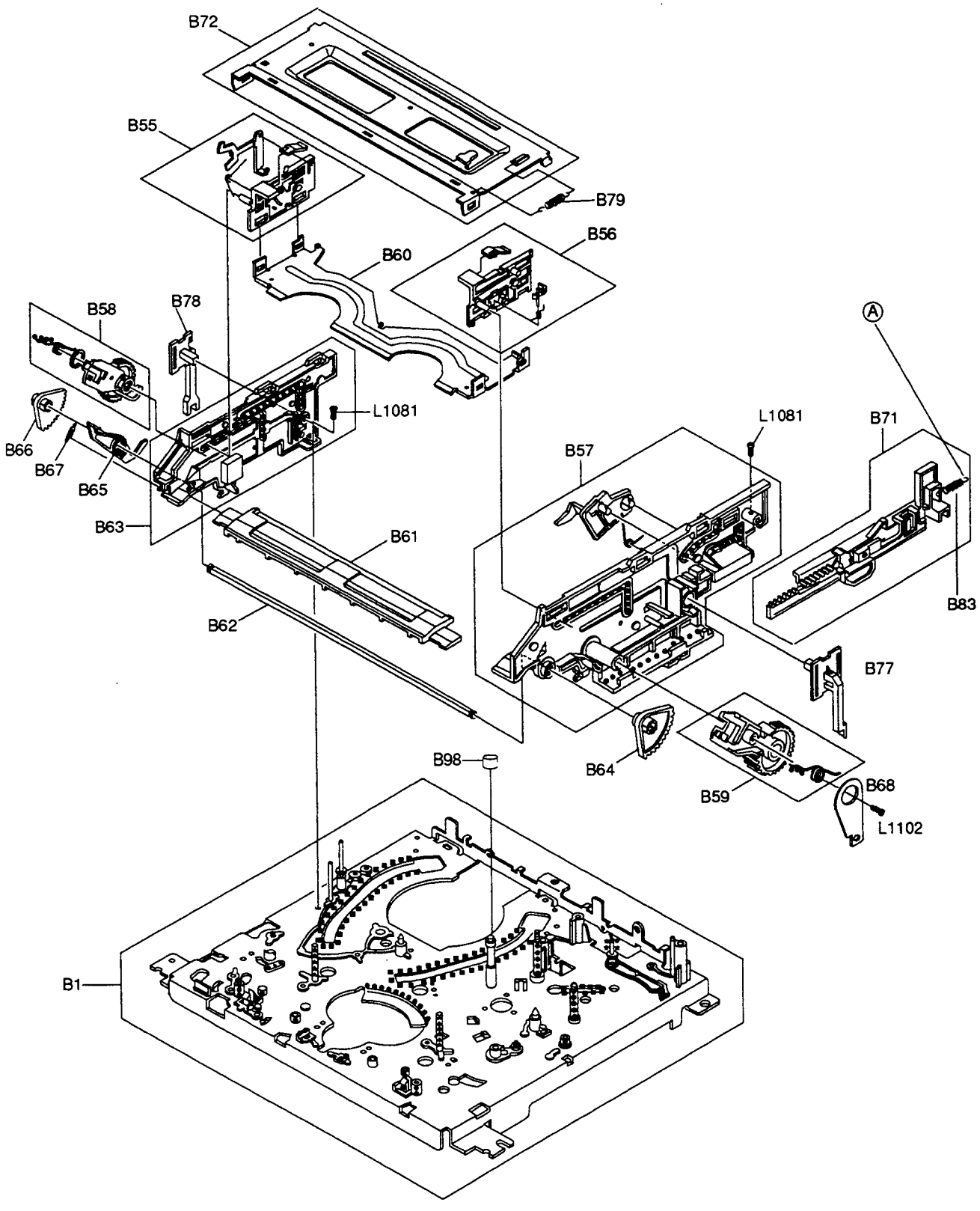
Mark	Drscription	Part No.
×××××	Sankohl	FG-84M
■■■■■	Three Bond	TB-1901
●●●●●	Molycourt	EM-30LG
▲▲▲▲▲	Slidus Oil	#150
★★★★★	Floil	GP-327



See Electrical Parts List

VIEW 3

Mark	Drscription	Part No.
×××××	Sankohl	FG-84M
■■■■■	Three Bond	TB-1901
●●●●●	Molycourt	EM-30LG
▲▲▲▲▲	Slidus Oil	#150
★★★★★	Floil	GP-327



DECK MECHANICAL REPLACEMENT PARTS LIST

Ref. No.	Description	Parts No.	Q'ty
	DECK ASS'Y	N1101XA	
B 1	CHASSIS ASS'Y	0VSA04780	1
B 2	CYLINDER ASS'Y PAL 2HD 1SPEED	0VM301380	1
B 2	CYLINDER ASS'Y PAL 2HD 2SPEED	0VM301381	1
B 3	LDG MOTOR PREPARATION	0VSA04781	1
B 4	MOTOR HOLDER CALKING ASS'Y	0VM403364	1
B 5	CASSETTE DRIVE LEVER ASS'Y	0VM403507	1
B 6	PINCH ROLLER ARM ASS'Y	0VM402563	1
B 7	PINCH ARM ASS'Y	0VM402387	1
B 8	PULLEY ASS'Y	0VSA04757	1
B 9	MOVING GUIDE S ASS'Y	0VSA04237	1
B 10	MOVING GUIDE T ASS'Y	0VSA04240	1
B 11	LOADING ARM A ASS'Y	0VSA04214	1
B 12	LOADING ARM B ASS'Y	0VSA04215	1
B 13	LOADING ARM M ASS'Y	0VM402559	1
B 14	PINCH ROLLER SP	0VM403949	1
B 15	LUMIRROR WASHER 3.1X6X0.35	0VM403269	1
B 16	CAM	0VM200960	1
B 17	P.S.W 1.7X3.2X0.5T	0VM403678	1
B 18	FRICTION GEAR SPRING	0VM402740	1
B 19	FRICTION GEAR	0VM402661	1
B 20	KICK ARM	0VM402662	1
B 21	LDG BELT	0VM403432	1
B 22	P.S.W A	0VM402624	1
B 26	CLUTCH BLOCK ASS'Y	0VSA05055	1
B 27	BAND BRAKE ASS'Y	0VSA04658	1
B 28	MAIN BRAKE S ASS'Y	0VSA04212	1
B 29	MAIN BRAKE T ASS'Y	0VSA04213	1
B 30	T BRAKE ARM ASS'Y	0VSA04641	1
B 31	AC HEAD ASS'Y	0VSA04756	1
B 32	REEL BASE ASS'Y	0VSA04759	1
B 34	MAIN LEVER ASS'Y	0VM402558	1
B 35	TAPE GUIDE ASS'Y	0VM402560	1
B 36	TENSION LEVER SP ASS'Y	0VSA04550	1
B 37	CAPSTAN MOTOR F2QKB92	MMDDB5ZSJ002	1
B 37	CAPSTAN MOTOR DFX-67B1VWA	MMDDB5ZMS002	1
B 38	MODE CHANGE LEVER	0VM201139	1
B 39	M BRAKE(S)SPRING	0VM402579	1
B 40	M BRAKE(S)LEVER	0VM300753	1
B 41	S BRAKE ARM	0VM300754	1
B 42	M BRAKE T ARM SPRING	0VM402582	1
B 43	T BRAKE SPRING	0VM402580	1
B 44	HEAD ADJUST SPRING	0VM402567A	1
B 45	M LEVER SPRING	0VM402570	1
B 46	TAPE GUIDE ARM SPRING	0VM402581	1
B 47	TAPE GUIDE ARM ADJUST SCREW	0VM403242	1
B 48	ADJUST NUT	0VM403698	1
B 49	BT DRIVE ARM	0VM300756	1
B 51	CHANGE ARM	0VM402441	1
B 52	BELT FWD	0VM402397	1
B 53	P.S.W 3.1X6X0.3T	0VM403737	1
B 54	EARTH BRUSH ASS'Y	0VM403225	1
B 55	C.SLIDER L ASS'Y	0VSA04487	1
B 56	C.SLIDER R ASS'Y	0VSA04488	1
B 57	CASSETTE GUIDE R ASS'Y	0VSA04778	1
B 58	C.D. GEAR L ASS'Y	0VSA04494	1

Ref. No.	Description	Parts No.	Q'ty
B 59	C.D. GEAR R ASS'Y	0VSA04495	1
B 60	CASSETTE PLATE	0VM300779	1
B 61	FRONT GUIDE	0VM300776	1
B 62	GEAR CONNECT SHAFT	0VM402506	1
B 63	CASSETTE GUIDE L	0VM200689D	1
B 64	INTERLOCKING GEAR R	0VM300786	1
B 65	FRONT DOOR OPENER	0VM300781	1
B 66	INTERLOCKING GEAR L	0VM300787	1
B 67	FRONT DOOR OPENER SPRING	0VM403962	1
B 68	DRIVING GEAR REINFORCEMENT	0VM402961	1
B 71	FL RACK	0VM201022C	1
B 72	UPPER PLATE	0VM201033	1
B 73	FE HEAD	DHVEC01AL001	1
B 74	LUMINESCENCE PRISM	0VM301291	1
B 75	REC ARM U5	0VM300755G	1
B 76	REC ARM SPRING	0VM402578	1
B 77	PRISM R	0VM301292	1
B 78	PRISM L	0VM301293	1
B 79	EARTH SPRING	0VM403524	1
B 80	SPRING FOR PRESSING PACK	0VM403674	1
B 81	M LEVER HOLDER ASS'Y	0VSA04897	1
B 82	KICK ARM HOLDER	0VM301397C	1
B 83	RACK SPRING	0VM403894	1
B 84	PRESS FIT BUSH	0VM403652	1
B 99	REC SPACER	0VM403714	1
B 101	P.S.W 3.1X6X0.4T	0VM403738	1
L 1011	SCREW, S-TIGHT M3X9 PAN HEAD +	GPMS3090	3
L 1051	SCREW, S-TIGHT M2.6X6 PAN HEAD +	GPMS9060	3
L 1052	SCREW, S-TIGHT M2.6X6 PAN HEAD +	GPMS9060	1
L 1053	SCREW, S-TIGHT M2.6X6 PAN HEAD +	GPMS9060	2
L 1061	SCREW, S-TIGHT M2.6X4 PAN HEAD +	GPMS9040	1
L 1081	SCREW, S-TIGHT, BIND HEAD 3X6	GBMS3060	2
L 1091	S TIGHT SCREW M3X6 CUP+	GCMS3060	1
L 1101	P TIGHT SCREW 3X8 BIND+	GBMP3080	3
L 1102	P TIGHT SCREW 3X8 BIND+	GBMP3080	1
L 1111	P TIGHT SCREW M3X6 CUP+	GCMP3060	1
L 1121	HEXAGON NUT M3	NHMN030	1
L 1151	SCREW, SEMS M3X4 PAN HEAD +	CPM33040	2
L 1191	SCREW, P-TIGHT 2.6X10 PAN HEAD +	GPMP9100	1
L 1202	B TIGHT SCREW 3X6 PAN HEAD +	GPMB3060	1
L 1211	SCREW, P-TIGHT WASHER HEAD M3X8	GCMP3080	1
L 1221	SCREW,SPECIAL	0VM403688	1
L 1231	SPACER SCREW ASS'Y	0VM403752	1
L 1241	SCREW, P-TIGHT M2X6 +BIND	GBMP2060	1
PCB-2	JOINT PCB ASS'Y (See Electrical Replacement List)	0VSA04655	1

DECK ELECTRICAL REPLACEMENT PARTS LIST

JOINT C.B.A.

Ref. No.	Description	Parts No.
	JOINT C.B.A. **Consist of the following:**	0VDM05228
CL2902	JUMPER WIRE 6P	WX1K7010-001
CL2901	JUMPER WIRE 5P	WX1K7010-003
CN2902	ANGLE PIN HEADER 2P	1740775
CN2901	ANGLE SOCKET CONNECTOR 20P	1770615
CN2801	FFC CONNECTOR BASE TOP 9P	JC2SJ09ERHOC or
	FFC CONNECTOR BASE TOP 9P	1700915 or
	FFC CONNECTOR BASE TOP 9P	1700449 or
	FFC CONNECTOR BASE TOP 9P	1700515 or
	FFC CONNECTOR BASE TOP 9P	1700986
R2801	CARBON RES. 1/5W J 47K or	1324473T or
	CARBON RES 1/6W J 47K or	132A473T or
	CARBON RES 1/7W J 47K	RCX4JATZ0473
R2802	CARBON RES. 1/5W J 47K or	1324473T or
	CARBON RES 1/6W J 47K or	132A473T or
	CARBON RES 1/7W J 47K	RCX4JATZ0473

MODE SW C.B.A.

Ref. No.	Description	Parts No.
	MODE SW C.B.A. **Consist of the following:**	0VDM05229
SW2901	MODE SWITCH	SSR0401HD001

ACE HEAD C.B.A.

Ref. No.	Description	Parts No.
	ACE HEAD C.B.A. **Consist of the following:**	0VDM05369
CN2903	FALT CABLE CONNECTOR 6P	JEHBJ06JE001